LAKE HAVASU CITY, ARIZONA
WATER CONSERVATION PROGRAM IMPLEMENTATION, PACKAGE NO. 2
PROJECT NO. SS2970
AUGUST 2016
VOLUME NO. 2 OF 2

LAKE HAVASU CITY

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DOUG THOMAS

PROJECT MANAGER
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SUDDENLINK	(928) 855-9855
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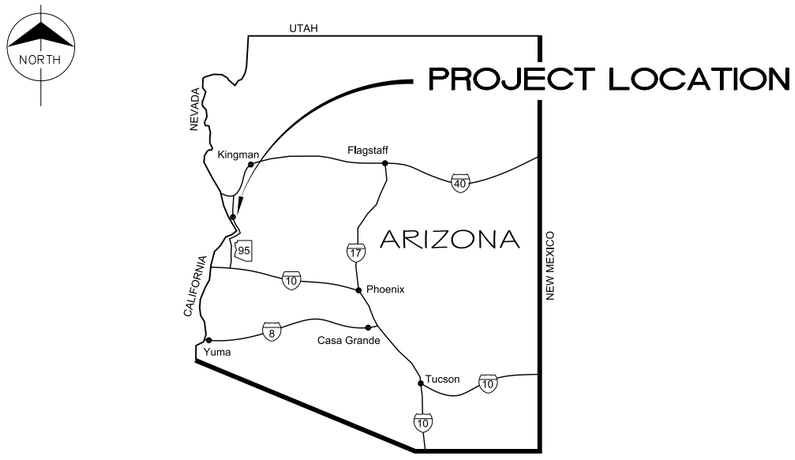

VICINITY MAP

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LAKE HAVASU CITY

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LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION PROGRAM IMPLEMENTATION PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

GENERAL
COVER

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED 08/31/2016
ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number:
G-001
Sheet 1 OF 43

LAST SAVED BY: gdavis

PROJECT NO. 9800A10 FILE NAME: P2-9800A10-G-001.dwg

CONSTRUCTION NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THE LATEST MARICOPA ASSOCIATION OF GOVERNMENTS, UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION (MAG), OTHER CITY'S, AND ADOT DETAILS (AS CITED IN PROJECT PLANS AND SPECIFICATIONS), LAKE HAVASU CITY STANDARD DETAILS WILL CONTINUE TO APPLY WHERE SUCH DETAILS WERE NOT ADOPTED OR INCLUDED BY MAG. ALTERNATE DETAILS AND SPECIFICATIONS MAY BE SUBMITTED FOR REVIEW AND ACCEPTANCE BY THE ENGINEERING DIVISION. IF ACCEPTED, ALTERNATE DETAILS WILL BE SHOWN AS PART OF THE APPROVED PLANS/DETAIL SHEETS.
2. THIS SET OF PLANS HAS BEEN REVIEWED FOR COMPLIANCE WITH CITY REQUIREMENTS PRIOR TO ISSUANCE OF CONSTRUCTION PERMITS. HOWEVER, SUCH REVIEW SHALL NOT PREVENT THE CITY ENGINEER FROM REQUIRING CORRECTION OF ERRORS OR OMISSIONS IN PLANS FOUND TO BE IN VIOLATION OF ANY LAW OR ORDINANCE.
3. APPROVAL BY THE CITY ENGINEER MEANS FOR GENERAL LAYOUT IN RIGHT-OF-WAY ONLY. CONSTRUCTION PERMITS SHALL BE OBTAINED WITHIN THIS PERIOD OR THE PLANS SHALL BE RESUBMITTED FOR APPROVAL. WORK SHALL ALSO BE CONTINUOUSLY PURSUED IN ORDER TO MAINTAIN A VALID PLAN APPROVAL AND PERMIT. APPROVAL IS ONLY FOR WORK WITHIN THE JURISDICTION OF LAKE HAVASU CITY.
4. THE ENGINEERING DIVISION SHALL BE NOTIFIED TWENTY-FOUR (24) HOURS PRIOR TO ANY CONSTRUCTION WORK BY TELEPHONE AT (928) 453-4148, ANY WORK CONCEALED WITHOUT INSPECTION SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
5. AN APPROVED SET OF PLANS MUST BE AVAILABLE ON THE JOB SITE AT ALL TIMES. THE CONTRACTOR'S REPRESENTATIVE (CAPABLE OF COMMUNICATING WITH THE CITY'S REPRESENTATIVES) SHALL BE ON THE JOB AT ALL TIMES THE WORK IS BEING PURSUED.
6. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE EMERGENCY TELEPHONE NUMBERS TO LAKE HAVASU CITY AT TIME OF ISSUANCE OF OFF-SITE/ON-SITE PERMITS AND HAVE PERSONNEL AVAILABLE 24-HOURS A DAY TO RESPOND TO EMERGENCIES. IF THE CITY IS REQUIRED TO RESPOND AND MAKE EMERGENCY REPAIRS ON BEHALF OF THE CONTRACTOR, THE CONTRACTOR IS RESPONSIBLE TO REIMBURSE THE CITY FOR ALL COSTS INCURRED.
7. IT SHALL BE THE RESPONSIBILITY OF THE PERMITTEE TO ARRANGE FOR THE RELOCATION AND RELOCATION COSTS OF ALL UTILITIES, AND SUBMIT A UTILITY RELOCATION SCHEDULE PRIOR TO THE ISSUANCE OF A CONSTRUCTION PERMIT.
8. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO VERIFY THE PRESENCE AND LOCATION OF ALL EXISTING OVERHEAD AND/OR UNDERGROUND UTILITIES THAT MAY INTERFERE WITH THIS CONSTRUCTION, WHETHER OR NOT SAID UTILITIES ARE SHOWN ON THE CONSTRUCTION PLANS FOR THIS PROJECT AND TO ADEQUATELY PROTECT AND MAINTAIN ANY SUCH UTILITIES.
9. THE CONTRACTOR SHALL CONTACT BLUE STAKE 1-800-782-5348 PRIOR TO CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN CURRENT BLUE STAKE MARKINGS THROUGHOUT CONSTRUCTION.
10. ALL DRAINAGE PROTECTIVE DEVICES SUCH AS SWALES, INTERCEPTION DITCHES, PIPES, PROTECTIVE BERMS, CONCRETE CHANNELS OR OTHER MEASURES DESIGNED TO PROTECT IMPROVEMENTS, WHETHER EXISTING OR PROPOSED, FROM RUNOFF OR DAMAGE FROM STORM WATER, MUST BE CONSTRUCTED PRIOR TO THE CONSTRUCTION OF ANY IMPROVEMENTS.
11. TRAFFIC CONTROL SHALL CONFORM WITH THE TRAFFIC BARRICADE MANUAL AND MUTCD GUIDELINES. THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN PER THE TRAFFIC BARRICADE MANUAL. BARRICADES MUST BE CONTINUALLY MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. A TRAFFIC CONTROL PLAN (TCP) SHALL BE SUBMITTED TO THE ENGINEERING DIVISION AND ACCEPTED A MINIMUM OF 24-HOURS PRIOR TO CONSTRUCTION. AN ACCEPTED TCP WILL BE STAMPED AND A COPY RETURNED TO THE CONTRACTOR. A COPY OF THE ACCEPTED PLAN MUST REMAIN ON THE JOB SITE AT ALL TIMES.
12. TRAFFIC CONTROL SHALL CONFORM TO THE MUTCD GUIDELINES. BARRICADES MUST BE CONTINUALLY MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. A TRAFFIC CONTROL PLAN SHALL BE SUBMITTED TO THE LAKE HAVASU CITY.
13. ALL CONTRACTORS ARE RESPONSIBLE TO OBTAIN AN ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM (AZPDES) PERMIT IN ACCORDANCE WITH FEDERAL AND STATE REGULATIONS, INCLUDING NOTICE OF INTENT (NOI), NOTICE OF TERMINATION, AND STORM WATER POLLUTION PREVENTION PLAN (SWPPP). A COPY OF THE NOI AND SWPPP SHALL BE AVAILABLE ON THE JOB SITE AT ALL TIMES.
14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ANY AND ALL OTHER PERMITS AND MEET ANY REQUIREMENTS SET FORTH BY OTHER AGENCIES OR UTILITIES, WHICH HAVE JURISDICTION, AT THE CONTRACTORS EXPENSE, INCLUDING OSHA. CONTRACTOR SHALL MEET OSHA STANDARDS FOR TRENCH SAFETY.
15. FIRE ACCESS TO BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION AS REQUIRED BY LAKE HAVASU CITY FIRE DEPARTMENT.
16. EXISTING LANDSCAPING AND/OR IRRIGATION SYSTEMS DISTURBED BY CONSTRUCTION SHALL BE REPLACED IN KIND BY THE CONTRACTOR AT CONTRACTOR'S EXPENSE. THE WORK SHALL BE COORDINATED WITH LAKE HAVASU CITY ENGINEERING DIVISION.
17. ALL EXISTING PAVEMENT MARKINGS, TRAFFIC SIGNS, AND SIGNAL EQUIPMENT THAT NEED TO BE REMOVED, REPLACED, RELOCATED, OR REPAIRED DUE TO CONTRACTOR'S WORK SHALL BE DONE BY THE CONTRACTOR AT HIS EXPENSE.
18. COORDINATE SHUTDOWN AND SEQUENCING REQUIREMENTS WITH OWNER 48 HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR MUST HAVE AN APPROVED SEQUENCING PLAN PRIOR TO ANY CONSTRUCTION.
19. CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING STAGING AREAS FOR THEIR WORK.

LAKE HAVASU CITY GENERAL NOTES

1. CONTRACTOR SHALL VERIFY ALL QUANTITIES PRIOR TO CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR ALL TRAFFIC AND DUST CONTROL.
3. ALL VALVES AND MANHOLES SHALL BE ADJUSTED TO FINISH GRADE WHERE NECESSARY.
4. CONTRACTOR SHALL MAINTAIN A MINIMUM ONE LANE OF TRAFFIC IN EACH DIRECTION AT ALL TIMES.
5. ALL EXISTING CENTERLINE MONUMENTATION SHALL BE PROTECTED OR REPLACED IF DAMAGED.

NOTE TO CONTRACTOR

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE BLUE STAKE CENTER TWO WORKING DAYS PRIOR TO ANY EXCAVATION. THE UNDERGROUND UTILITY LOCATIONS AS SHOWN HEREON ARE BASED ON THE BEST INFORMATION AVAILABLE FROM UTILITY RECORDS AND OTHER DATA AS SUPPLIED TO THE ENGINEER. THERE MAY BE OTHER UNDERGROUND UTILITY LINES, SERVICE LINES AND STRUCTURES PRESENT IN THE SUBJECT AREA. THE CONTRACTOR SHALL VERIFY LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES PRIOR TO ANY DEMOLITION OR CONSTRUCTION WORK.

LEGEND

NEW STRUCTURE
NEW PIPE
NEW ELECTRICAL DUCT — E — E — E —
EXISTING CONTOUR — 1258 —
NEW CONTOUR — 1320 —
PROPERTY LINE
EASEMENT
RIGHT OF WAY LINE
CURB AND GUTTER
EXISTING EDGE OF PAVEMENT
EXISTING UNDERGROUND ELECTRIC — EUG —
EXISTING OVERHEAD ELECTRIC — OHE —
EXISTING UNDERGROUND TELEPHONE — UGT —
EXISTING OVERHEAD TELEPHONE — OHT —
EXISTING RECLAIMED WATERLINE — RW —
EXISTING WATER MAIN — W —
EXISTING SEWER — S —
EXISTING GAS LINE — G —
EXISTING STORM DRAIN — SD —
EXISTING TELEPHONE — T —
EXISTING FENCE
EXISTING CHAIN LINK FENCE — x —
EXISTING WALL
REMOVAL
CONCRETE
ASPHALT
POWER POLE
EXISTING STREET SIGN
EXISTING BACK TO BACK STREET SIGN
EXISTING PEDESTRIAN SIGN
EXISTING TRAFFIC SIGNAL
EXISTING STREET LIGHT
EXISTING FIRE HYDRANT
FIRE HYDRANT

BENCHMARK
MONUMENT
CONTROL POINT
BORING LOCATION (NUMBER DESIGNATION) B-1
MONITORING WELL
PIEZOMETER
TEST PIT
NEW SPOT ELEVATION 568.5
EXISTING SPOT ELEVATION 567.5
ELECTRICAL MANHOLE AND PULL BOX EMH
MANHOLE MH
ROADWAY CROSS-SLOPE 0.02 (ft/ft)
ROADWAY GRADE S=0.0100 (ft/ft)
TREE MISCELLANEOUS
TREE, PALM
BUSH: 3 FT DIA
BUSH; 4 FT DIA
BUSH: 5 FT DIA
EXISTING VALVE WV
NEW VALVE
DRAINAGE DIRECTION

ABBREVIATIONS

ABAND	ABANDONED
ABC	AGGREGATE BASE COURSE
AC	ASPHALT CONCRETE ASBESTOS CONCRETE
APPROX	APPROXIMATE
ASU	ARIZONA STATE UNIVERSITY
AVE	AVENUE
BC	BACK OF CURB
BCHH	BRASS IN HAND HOLE
BM	BENCHMARK
BOTT	BOTTOM
℄	CENTERLINE
CATV	CABLE TELEVISION
CB	CATCH BASIN
CLD	CONCRETE LINED DITCH
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CONC	CONCRETE
CONST	CONSTRUCTION
CP	CONTROL POINT
CMU	CONCRETE MASONRY UNIT
CTL	CONTROL
CY	CUBIC YARD
DET	DETAIL
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DET	DETAIL
DR	DRIVE OR DIAMETER RATIO
DWG	DRAWING
E	EAST OR ELECTRICAL
EA	EACH
EF	EACH FACE
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELECTRICAL
EOP	EDGE OF PAVEMENT
ESMT	EASEMENT
EW	EACH FACE
EXIST	EXISTING
FCA	FLANGE COUPLING ADAPTER
FM	FORCE MAIN
FD	FOUND
FE	FLANGE END
FF	FINISH FLOOR
FG	FINISH GRADE
FH	FIRE HYDRANT
FT	FOOT
FPT	FEMALE PIPE THREAD
G	GAS
GPM	GALLONS PER MINUTE
GRD	GROUND, GRADE
GV	GATE VALVE
HH	HANDHOLE
HORIZ	HORIZONTAL
H&T	HUB & TACK
HP	HIGH POINT OR HORSEPOWER
IN	INCH(ES)
INV	INVERT
IP	IRON PIPE
IRR	IRRIGATION
L	LENGTH
LF	LINEAR FEET
LHC	LAKE HAVASU CITY
LT	LEFT
M	MONUMENT LINE
MAG	MARICOPA ASSOCIATION OF GOVERNMENTS
MATL	MATERIAL
MAX	MAXIMUM
MCDOT	MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
MJ	MECHANICAL JOINT
MH	MANHOLE
MIN	MINIMUM
MON	MONUMENT
MPT	MALE PIPE THREAD
MUTCD	MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES
N	NORTH
NG	NATURAL GRADE
NO. #	NUMBER
OD	OUTSIDE DIAMETER
OSHA	OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION
OHE	OVERHEAD ELECTRICAL
OHT	OVERHEAD TELEPHONE
P℄	PROPERTY LINE
P	PAVEMENT
PAE	PUBLIC ACCESS EASEMENT
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	POTABLE WATER
REINF	REINFORCING
RLS	REGISTERED LAND SURVEYOR
R/W OR ROW	RIGHT OF WAY
RPPBA	REDUCED PRESSURE PRINCIPLE BACK FLOW ASSEMBLY
RT	RIGHT
RW	RECLAIMED WATER LINE
S	SOUTH, SLOPE
SCH	SCHEDULE
SD	STORM DRAIN
SEC, SECT	SECTION
SES	SERVICE ENTRANCE SECTION
SF	SQUARE FEET
SPEC	SPECIFICATIONS
SRP	SALT RIVER PROJECT
SS	SANITARY SEWER
STA	STATION
STD(S)	STANDARD(S)
T	TOWNSHIP, TOP OR TELEPHONE
T & B	TOP AND BOTTOM
T/P	TOP OF PAVEMENT
T/GRATE	TOP OF GRATE
TANG	TANGENTIAL
TBM	TEMPORARY BENCHMARK
TCE	TEMPORARY CONSTRUCTION EASEMENT
TEL	TELEPHONE
TEMP	TEMPORARY
T.O.F.	TOP OF FOOTING
T.O.W.	TOP OF WALL
TYP	TYPICAL
VERT	VERTICAL
UGE	UNDERGROUND ELECTRICAL
UGT	UNDERGROUND TELEPHONE
UNO	UNLESS OTHERWISE NOTED
W	WEST OR WATERMAIN
W/	WITH
W/O	WITHOUT
WM	WATER METER

DETAIL REFERENCES

CONSTRUCTION NOTES:
1 WATERLINE CONSTRUCTION NOTES
33 DUCT-BANK CONSTRUCTION NOTES

A / M-00 Misc Symbols 55 23 D10 M80 33

Elevation Box
CL or TOC
INV 1325.00

Existing Contour Tag
1000

A / 10-M-99 Use for Detail Reference

FOR REVISIONS ONLY 9

FOR COLUMNS GRIDS 1

A PLAN TITLE

C / - Upper Line SECTION TITLE

3 / - Upper Line DETAIL TITLE

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

GENERAL
GENERAL NOTES 1

Registered Professional Engineer (Civil) CERTIFICATE NO. 44630 GREG A. GOULD DATE SIGNED 06-30-18 ARIZONA, U.S.A.
EXPIRES 06-30-2018

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BID SET

Sheet Number: G-002
Sheet 2 OF 43

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SPECIFICATIONS

CONTRACTOR SHALL REVIEW ALL SPECIFICATIONS BELOW. THE REMAINING APPLICABLE SPECIFICATIONS CAN BE ACCESSED AT:
HTTP://WWW.LHCAZ.GOV/COMMINITY-INVESTMENT/ENGINEERING/ENGINEERING-SPECIFICATIONS

CLEARING AND GRUBBING

1. CLEARING AND GRUBBING SHALL BE IN ACCORDANCE WITH LAKE HAVASU CITY SPECIFICATION SECTION 02100.

REMOVAL OF EXISTING IMPROVEMENTS

1. REMOVAL OF EXISTING IMPROVEMENTS SHALL BE IN ACCORDANCE WITH LAKE HAVASU CITY SPECIFICATION SECTION 02110.

SHEET AND SHORED EXCAVATIONS

1. SHEET AND SHORED EXCAVATIONS SHALL BE IN ACCORDANCE WITH LAKE HAVASU CITY SPECIFICATION SECTION 02254.

TRENCH EXCAVATION AND BACKFILL

1. TRENCH EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH LAKE HAVASU CITY SPECIFICATION SECTION 02300.

UTILITY VALVES AND ACCESSORIES

1. UTILITY VALVES AND ACCESSORIES SHALL BE IN ACCORDANCE WITH LAKE HAVASU CITY SPECIFICATION SECTION 02515.

REUSE LINE CONSTRUCTION

1. REUSE LINE CONSTRUCTION SHALL BE IN ACCORDANCE WITH LAKE HAVASU CITY SPECIFICATION SECTION 02551.
2. INSTALL A RESTRAINED MECHANICAL WEDGE ACTION JOINT RESTRAINT AT EVERY PVC TO DIP TRANSITION (EBAA SERIES 2000 PV, STAR PIPE SERIES 4000, OR EQUAL).
3. PVC C-900 SHALL BE DR 18.
4. PVC SCH 80 SHALL BE SOCKET WELDED.
5. PVC PIPING SHALL BE PURPLE IN COLOR, SHALL CONFORM TO ALL STANDARDS AND PROCEDURES, AND MEETING ALL TESTING AND MATERIAL PROPERTIES AS DESCRIBED IN THIS SPECIFICATION UNLESS OTHERWISE SHOWN.

DYE TESTING

1. DYE TESTING SHALL ONLY BE PERFORMED BY CERTIFIED PERSONNEL QUALIFIED TO PERFORM DYE TESTING ON POTABLE WATER SYSTEMS.
2. A LAKE HAVASU CITY ENGINEERING DIVISION REPRESENTATIVE MUST PRESENT DURING THE DYE TEST.
3. THE IRRIGATION SYSTEM MAY NOT BE CONNECTED TO THE RECLAIMED WATER METER UNTIL THE DYE TEST HAS BEEN PERFORMED AND IT HAS BEEN VERIFIED THAT NO CROSS-CONNECTIONS EXIST.
4. THE FOLLOWING IS THE SUGGESTED DYE TESTING METHOD:

   A. CONTRACTOR SHALL INSTALL A TEE OR WYE STRAINER ON THE SUPPLY SIDE OF THE RPA WITH A 1/2 OR 3/4 INCH FEMALE PIPE THREAD CONNECTION AND A TEMPORARY HOSE BIB AND INSTALLATION OF A TEMPORARY MALE OR FEMALE HOSE CONNECTION ON THE IRRIGATION SYSTEM (SEE FIGURE 1).

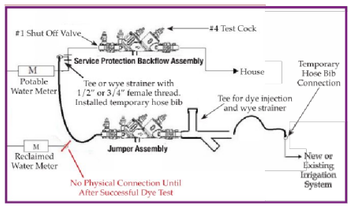

FIGURE 1: REQUIRED SET-UP FOR DYE TEST. ALL DYE TESTING IS DONE WITH POTABLE WATER

   B. BEFORE BEGINNING THE DYE TEST, THE CONTRACTOR SHALL COORDINATE WITH OWNER CHECKING ALL SITE AND AS-BUILT PLANS FOR ANY EXISTING ON-SITE PIPING AS WELL AS PUBLIC WATER MAINS TO ENSURE THAT ALL CONNECTIONS HAVE BEEN IDENTIFIED.

   C. VERIFY THAT POTABLE WATER IS AVAILABLE TO USE FOR THE DYE TEST AND THAT THE POTABLE WATER SYSTEM IS PROTECTED BY AN APPROVED RPA AT EACH SERVICE CONNECTION.

   D. IDENTIFY A SUITABLE LOCATION FOR THE JUMPER RPA AND INSTALL IT.

   E. USING THE HOSE BIB CONNECTIONS SHOWN IN FIGURE 1, MAKE THE CONNECTION FROM THE POTABLE WATER SYSTEM TO THE TEMPORARY JUMPER RPA WHICH CONNECTS TO THE ON-SITE RECLAIMED WATER SYSTEM.

   F. TURN OFF ALL POTABLE WATER CONNECTIONS AT THE NUMBER ONE SHUT OFF VALVES ON THE SERVICE PROTECTION RPAS, OPEN ALL NUMBER FOUR TEST COCKS ON THE SERVICE PROTECTION RPAS TO DRAIN ALL POTABLE WATER SYSTEM PRESSURE (FIGURE 2).

FIGURE 2 DRAINING WATER PRESSURE THROUGH TEST COCK #4

   G. ADD DYE AT THE DYE PORT. (FIGURE 3)

FIGURE 3: DYE IS ADDED THROUGH DYE PORT ON THE TEMPORARY JUMPER ASSEMBLY

   H. TURN ON POTABLE WATER TO ACTIVATE THE JUMPER ASSEMBLY AND PRESSURIZE THE IRRIGATION SYSTEM.

   I. ACTIVATE, ONE AT A TIME, EACH STATION OF THE IRRIGATION SYSTEM. COLORED WATER SHOULD COME OUT OF EACH OUTLET. ENSURE THAT ALL STATIONS ARE CHECKED, INCLUDING ALL SPRAY, DRIP AND BUBBLER OUTLETS (FIGURE 4).

FIGURE 4: ALL IRRIGATION STATIONS ARE CHECKED FOR THE PRESENCE OF COLORED WATER WATER

   J. TURN ON ALL INTERNAL AND EXTERNAL POTABLE WATER OUTLETS WHILE THE IRRIGATION SYSTEM IS PRESSURIZED. VERIFY THAT NO WATER, EITHER CLEAR OR COLORED COMES OUT OF THE OUTLETS (FIGURE 5). IF ANY CROSS-CONNECTIONS ARE DISCOVERED, DO NOT PROCEED WITH THE TEST. FOLLOW THE CROSS-CONNECTION RESPONSE PROCEDURES.

FIGURE 5: COLORED WATER IN INTERNAL FIXTURES INDICATES A CROSS-CONNECTION

   K. VERIFY THAT NO WATER, EITHER CLEAR OR COLORED, COMES OUT OF THE NUMBER FOUR TEST COCKS OF THE RPA(S) (FIGURE 6). IF ANY CROSS-CONNECTIONS ARE DISCOVERED, DO NOT PROCEED WITH THE TEST. FOLLOW THE CROSS-CONNECTION RESPONSE PROCEDURES.

FIGURE 6: COLORED WATER AT THE NUMBER 4 TEST COCK INDICATES A CROSS CONNECTION

COMPLETION OF DYE TEST

1. IF NO CROSS-CONNECTIONS ARE FOUND DURING TESTING, THE SITE IS READY TO BE CONNECTED TO THE RECLAIMED WATER SYSTEM.
2. THE TEMPORARY JUMPER ASSEMBLY IS REMOVED FROM THE IRRIGATION SYSTEM.
3. THE HOSE BIB CONNECTION ON THE SERVICE PROTECTION RPA IS REMOVED AND A THREADED PLUG IS INSTALLED IN THE TEE OR WYE STRAINER REPLACING THE HOSE BIB WITH A PERMANENT PLUG.
4. LAKE HAVASU CITY UNLOCKS THE RECLAIMED WATER METER AND AUTHORIZES THE CONTRACTOR TO CONNECT THE IRRIGATION SYSTEM TO THE RECLAIMED WATER METER.
5. ALL SITES WITH RECLAIMED WATER SERVICE SHOULD BE PERIODICALLY REINSPECTED AND TESTED FOR CROSS-CONNECTIONS EITHER WITH A DYE OR PRESSURE TEST.

CROSS-CONNECTION RESPONSE PROCEDURES

IN THE EVENT THAT A CROSS-CONNECTION IS DISCOVERED DURING THE DYE TEST, IMMEDIATE ACTION IS REQUIRED:

1. IMMEDIATELY TURN OFF THE JUMPER ASSEMBLY GOING TO THE PROPOSED RECLAIMED WATER SYSTEM.
2. TURN ON AND PRESSURIZE THE POTABLE WATER SYSTEM.
3. ASSIST IN IDENTIFYING THE LOCATION(S) OF BACKFLOW AND ELIMINATE THE CROSS CONNECTION(S).
4. FLUSH & REMOVE COLORED WATER FROM THE POTABLE WATER SYSTEM.
5. RESTART DYE TEST PROCEDURES FROM STEP ONE.

ASPHALT CONCRETE PAVEMENT

1. ASPHALT CONCRETE PAVEMENT REQUIREMENTS SHALL BE IN ACCORDANCE WITH LAKE HAVASU CITY SPECIFICATION SECTION 02630.

TRAFFIC CONTROL

1. TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH LAKE HAVASU CITY SPECIFICATION SECTION 02650.

TEMPORARY CONSTRUCTION FENCING

1. TEMPORARY CONSTRUCTION FENCING SHALL BE IN ACCORDANCE WITH LAKE HAVASU CITY SPECIFICATION SECTION 02810.

CONCRETE CURB, GUTTER, SIDEWALK AND DRIVEWAYS

1. CONCRETE CURB, GUTTER, SIDEWALK AND DRIVEWAYS SHALL BE IN ACCORDANCE WITH LAKE HAVASU CITY SPECIFICATION SECTION 03310.

GENERAL ELECTRICAL REQUIREMENTS

1. GENERAL ELECTRICAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH LAKE HAVASU CITY SPECIFICATION SECTION 16000.

KEY NOTES, C-SHEETS:

1. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 1 / C-013
2. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 2 / C-013
3. UPON COMPLETION OF REUSE WATER PIPELINE AND CONNECTION INSTALLATION, CONTRACTOR SHALL PERFORM A DYE TEST. A LHC ENGINEERING DIVISION REPRESENTATIVE MUST BE PRESENT DURING THE DYE TEST. CONTRACTOR SHALL NOTIFY THE LHC ENGINEERING DIVISION (24) HOURS PRIOR TO THE DYE TEST BY TELEPHONE AT (928)453-4148
4. CONTRACTOR SHALL COORDINATE EXACT TIE-IN LOCATION WITH OWNER IN THE FIELD PRIOR TO MAKING CONNECTION
5. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 3 / C-013
6. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 4 / C-013
7. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 5 / C-013
8. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 6 / C-013
9. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH SALVAGE LOOP AND VALVE TO LAKE HAVASU CITY 1 / C-014
10. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 2 / C-014
11. CONTRACTOR SHALL REMOVE CAP FROM EXIST 2" PVC W IN EXIST IRRIGATION BOX AND CONNECT RW TO EXIST PIPE
12. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 3 / C-014
13. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 4 / C-014
14. INSTALL CAP AND REMOVE EXIST IRRIGATION LOOP AND VALVE IN ACCORDANCE WITH SALVAGE LOOP AND VALVE TO LAKE HAVASU CITY 5 / C-014
15. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 1 / C-015
16. CONTRACTOR SHALL REMOVE AND REPLACE INTERFERING PORTION OF EXIST FENCE IN KIND AND AS NEEDED TO ACCOMMODATE PIPE INSTALLATION
17. CONNECT TIE-IN TO EXIST PIPELINE AND INSTALL PIPE LOOP IN ACCORDANCE WITH 2 / C-015
18. CONNECT TIE-IN TO EXIST PIPELINE AND INSTALL PIPE LOOP IN ACCORDANCE WITH 2 / C-015
19. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 1 / C-016
20. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 2 / C-016
21. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 3 / C-016
22. CONTRACTOR SHALL REMOVE AND REPLACE INTERFERING PORTION OF EXISTING CURB IN KIND AS NEEDED TO ACCOMMODATE PIPE INSTALLATION AND IN ACCORDANCE WITH SECTION 03310
23. CONTRACTOR SHALL REMOVE AND REPLACE INTERFERING PORTION OF EXISTING SIDEWALK, CURB AND GUTTER IN KIND AND AS NEEDED TO ACCOMMODATE PIPE INSTALLATION AND IN ACCORDANCE WITH SECTION 03310
24. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 1 / C-017
25. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 2 / C-017
26. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 3 / C-017
27. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 4 / C-017
28. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 5 / C-017

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

GENERAL
GENERAL NOTES 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

Registered Professional Engineer (Civil) CERTIFICATE NO. 44630 GREG A. GOULD DATE SIGNED 06/30/2016 ARIZONA, U.S.A.
EXPIRES 06-30-2018

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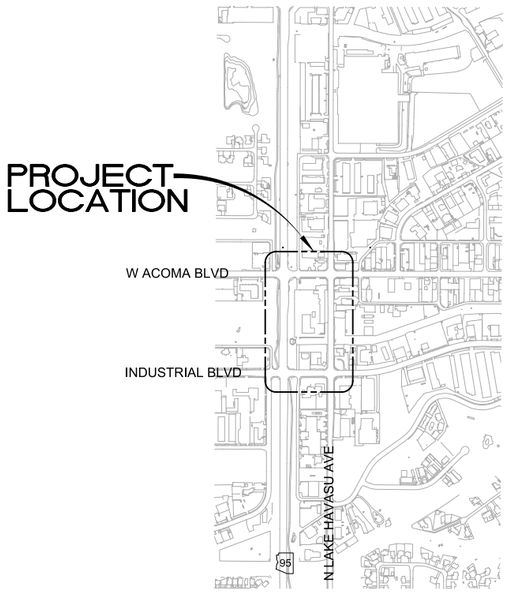
Sheet Number: G-003
Sheet 3 OF 43

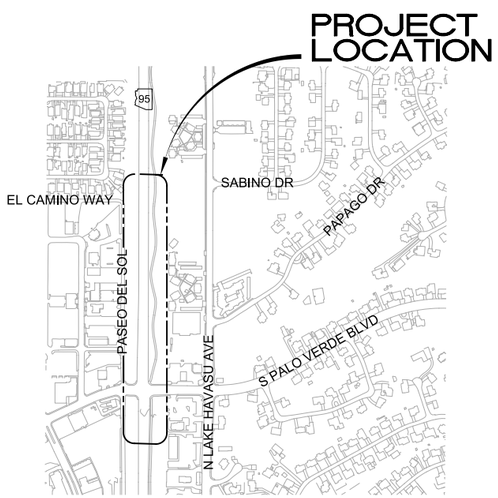
LAST SAVED BY: gdavis

PROJECT NO. 9800A10 FILE NAME: P2-9800A10-G-003.dwg



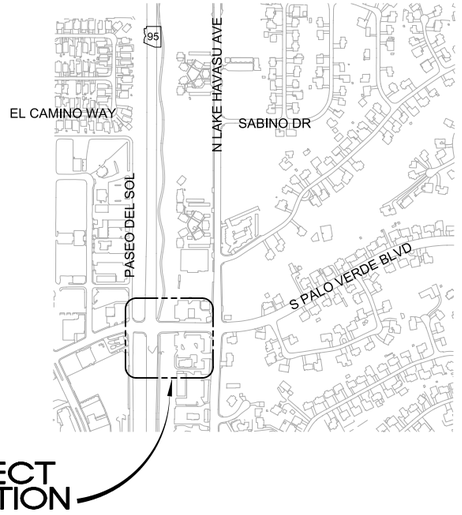
LOCATION MAP - W ACOMA BLVD - INDUSTRIAL BLVD

A FILE: -



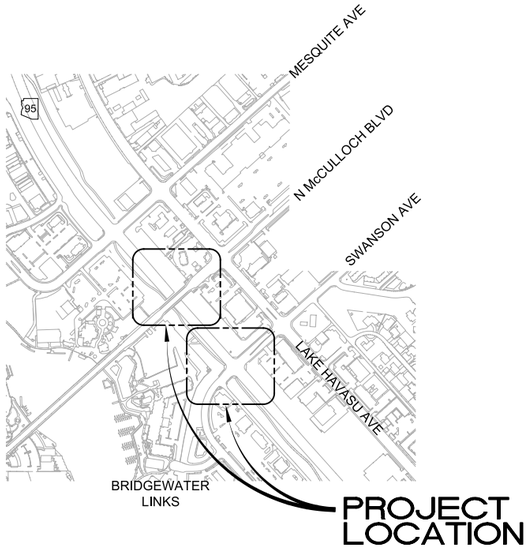
LOCATION MAP - PASEO DEL SOL

B FILE: -



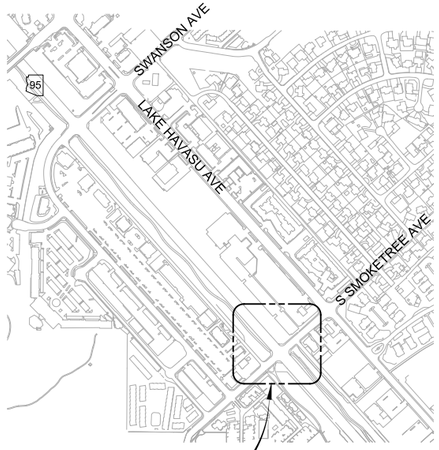
LOCATION MAP - S PALO VERDE BLVD

C FILE: -



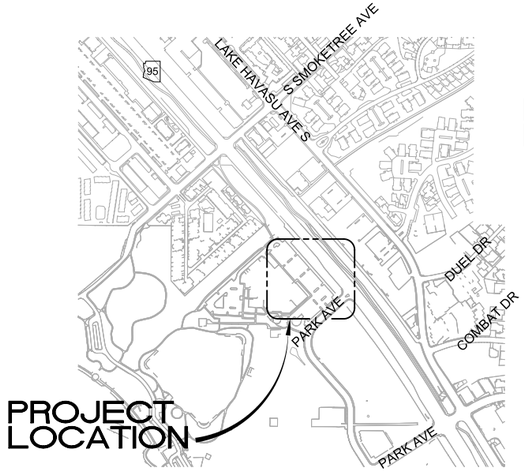
LOCATION MAP - McCULLOCH BLVD N - SWANSON AVE

D FILE: -



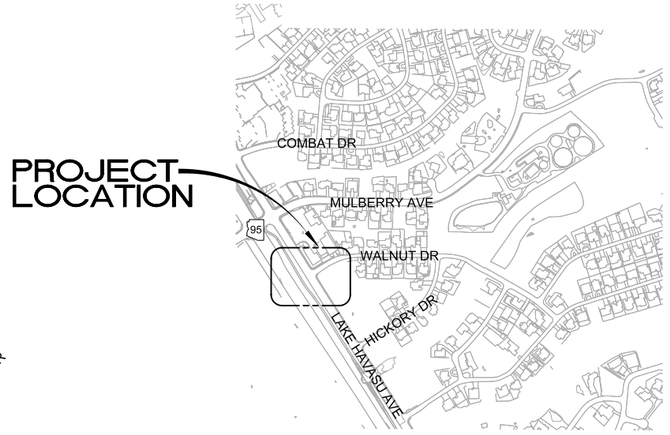
LOCATION MAP - S SMOKETREE AVE

E FILE: -



LOCATION MAP - LAKE HAVASU CITY AQUATIC CENTER

F FILE: -



LOCATION MAP - WALNUT DR

G FILE: -

NORTH

0 250' 500' 1000'

carollo

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT

WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

GENERAL
LOCATION MAPS 1

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED
ARIZONA, U.S.A.

EXPIRES 06-30-2018

Sheet Number:
G-004
Sheet 4 OF 43

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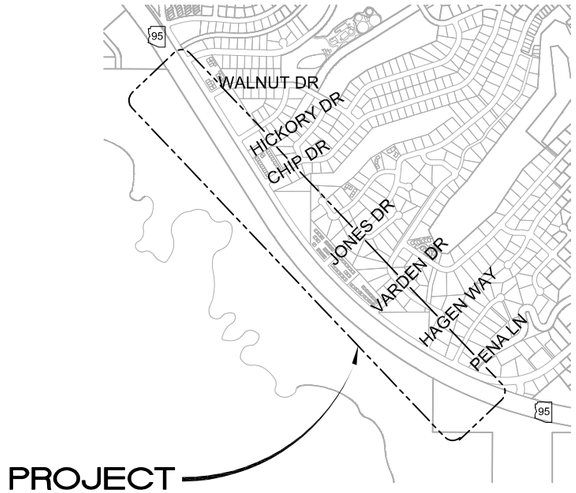
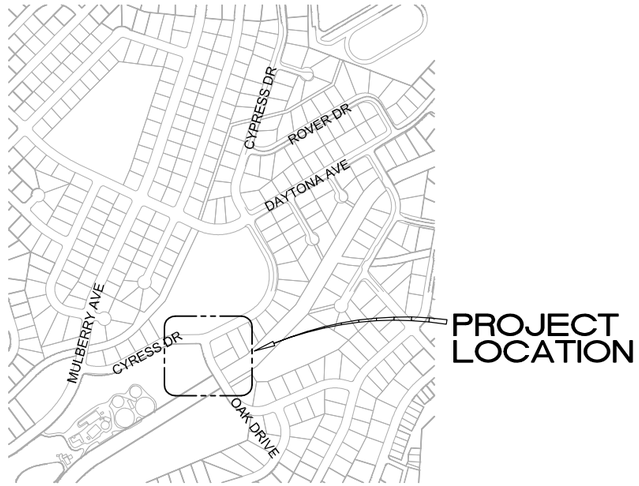
PROJECT NO. 9800A10 FILE NAME: P2-9800A10-G-004.dwg



H LOCATION MAP - SOUTH OF WALNUT DR

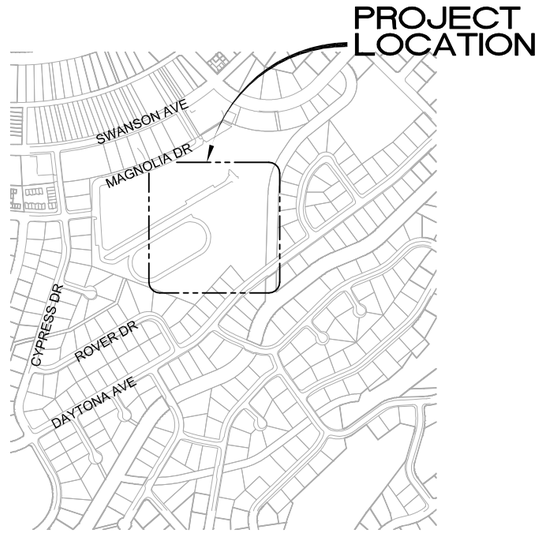
FILE: -

0 5000' 10000' 20000'



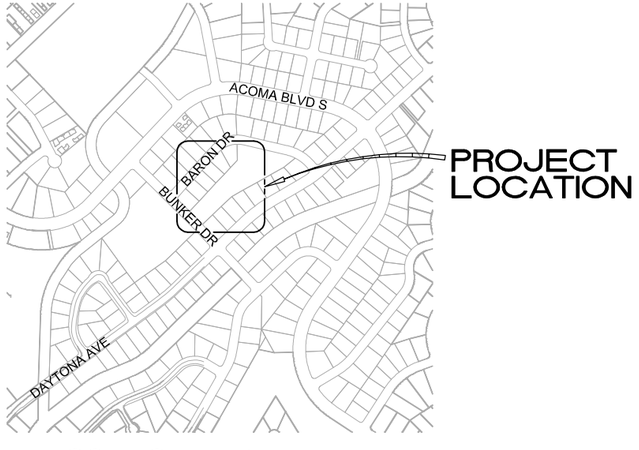
I LOCATION MAP - CYPRESS PARK

FILE: -



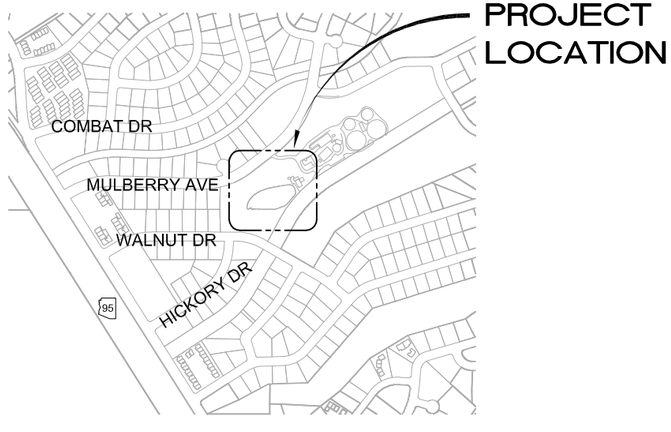
J LOCATION MAP - ASU CAMPUS

FILE: -



K LOCATION MAP - JACK HARDIE PARK

FILE: -



L LOCATION MAP - MULBERRY WWTP

FILE: -

0 250' 500' 1000'

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

GENERAL
LOCATION MAPS 2

Registered Professional Engineer (Civil) CERTIFICATE NO. 44630 GREG A. GOULD DATE SIGNED 06-30-2018 ARIZONA, U.S.A.

EXPIRES 06-30-2018

BID SET

Sheet Number:
G-005
Sheet 5 OF 43

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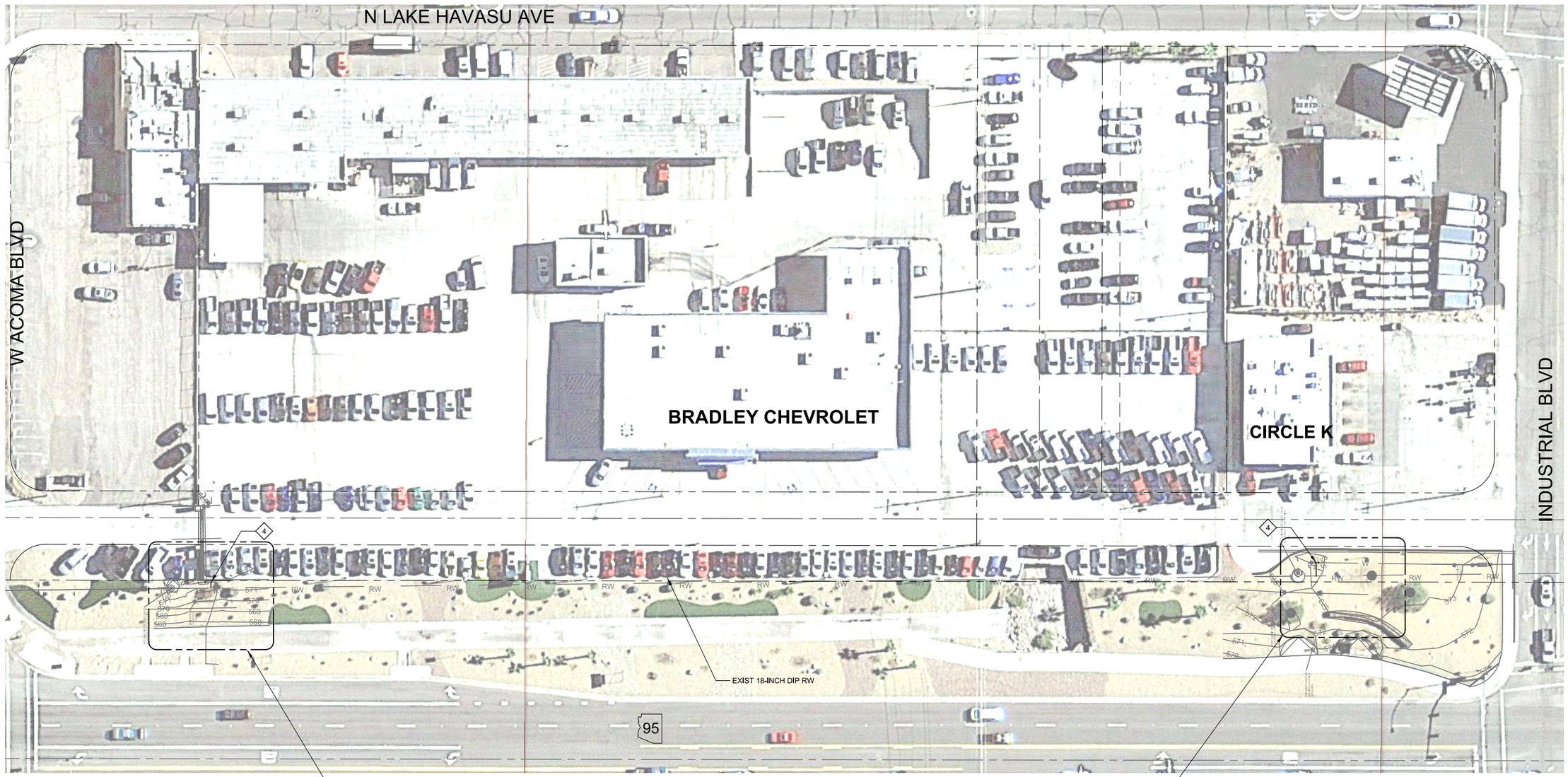

GENERAL NOTES

1. SEE SHEET NUMBER G-002 AND G-003 FOR GENERAL CIVIL NOTES, OVERALL KEY NOTES, AND SPECIFICATION NOTES.
2. PAVEMENT CUTS FOR RECYCLED WATERLINE ARE TO BE RESTORED IN ACCORDANCE WITH CONTRACT DOCUMENTS.
3. ALL PIPE SHALL USE JOINT RESTRAINTS OR THRUST BLOCKS IN ACCORDANCE WITH SPECIFICATIONS AND PER 1/C-019 AND 2/C-019 UNLESS SHOWN OTHERWISE.
4. ALL BURIED PIPING SHALL HAVE A MINIMUM OF 4 FOOT OF COVER.
5. INSTALL BURIED PIPE PER SPECIFICATIONS AND 1/C-018.
6. RECLAIMED WATER IRRIGATION SYSTEM, SPRINKLER HEADS, VALVE BOXES AND COVERS, AND FLOW CONTROL HANDLE ON VALVES SHALL BE PURPLE.
7. SEE SHEET NUMBERS C-021, C-022 AND C-023 FOR PARK SIGNAGE LOCATIONS.

KEY NOTES

1. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 1/C-013
2. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 2/C-013
3. UPON COMPLETION OF REUSE WATER PIPELINE AND CONNECTION INSTALLATION, CONTRACTOR SHALL PERFORM A DYE TEST. A LHC ENGINEERING DIVISION REPRESENTATIVE MUST BE PRESENT DURING THE DYE TEST. CONTRACTOR SHALL NOTIFY THE LHC ENGINEERING DIVISION (24) HOURS PRIOR TO THE DYE TEST BY TELEPHONE AT (928)453-4148
4. CONTRACTOR SHALL COORDINATE EXACT TIE-IN LOCATION WITH OWNER IN THE FIELD PRIOR TO MAKING CONNECTION

NORTH

0 10' 20' 30' 60'

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PROJECT NO. 9800A10 FILE NAME: P2-9800A10-C-001.dwg

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: GG
Drawn by: GD
Checked by: JW
Date: AUGUST 2016
Dwg scale:

CIVIL
SITE PLAN
W ACOMA BLVD TO
INDUSTRIAL BLVD

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A.
GOULD
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number:
C-001
Sheet 6 OF 43

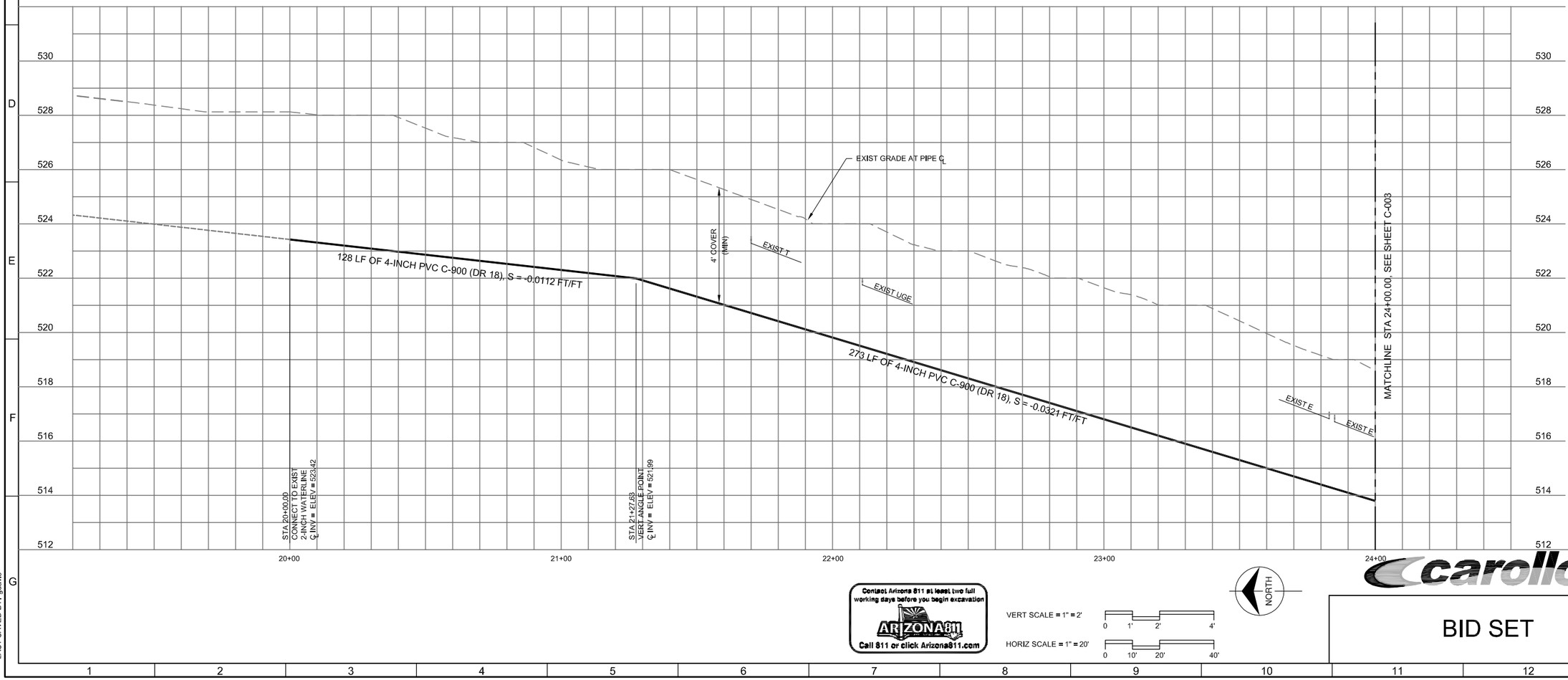
GENERAL NOTES

1. SEE SHEET NUMBER G-002 AND G-003 FOR GENERAL CIVIL NOTES, OVERALL KEY NOTES, AND SPECIFICATION NOTES
2. PAVEMENT CUTS FOR RECYCLED WATERLINE ARE TO BE RESTORED IN ACCORDANCE WITH CONTRACT DOCUMENTS.
3. ALL PIPE SHALL USE JOINT RESTRAINTS OR THRUST BLOCKS IN ACCORDANCE WITH SPECIFICATIONS AND PER 1 C-019 AND 2 C-019 UNLESS SHOWN OTHERWISE.
4. ALL BURIED PIPING SHALL HAVE A MINIMUM OF 4 FOOT OF COVER.
5. INSTALL BURIED PIPE PER SPECIFICATIONS AND 1 C-018
6. RECLAIMED WATER IRRIGATION SYSTEM, SPRINKLER HEADS, VALVE BOXES AND COVERS, AND FLOW CONTROL HANDLE ON VALVES SHALL BE PURPLE.
7. SEE SHEET NUMBERS C-021, C-022 AND C-023 FOR PARK SIGNAGE LOCATIONS.

KEY NOTES

4 CONTRACTOR SHALL COORDINATE EXACT TIE-IN LOCATION WITH OWNER IN THE FIELD PRIOR TO MAKING CONNECTION

5 CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 3 C-013



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NORTH

VERT SCALE = 1" = 2'
0 1' 2' 4'

HORIZ SCALE = 1" = 20'
0 10' 20' 40'

carollo

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

GENERAL
PASEO DEL SOL
PLAN AND PROFILE 1

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED 06-30-2016
ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number:
C-002
Sheet 7 OF 43

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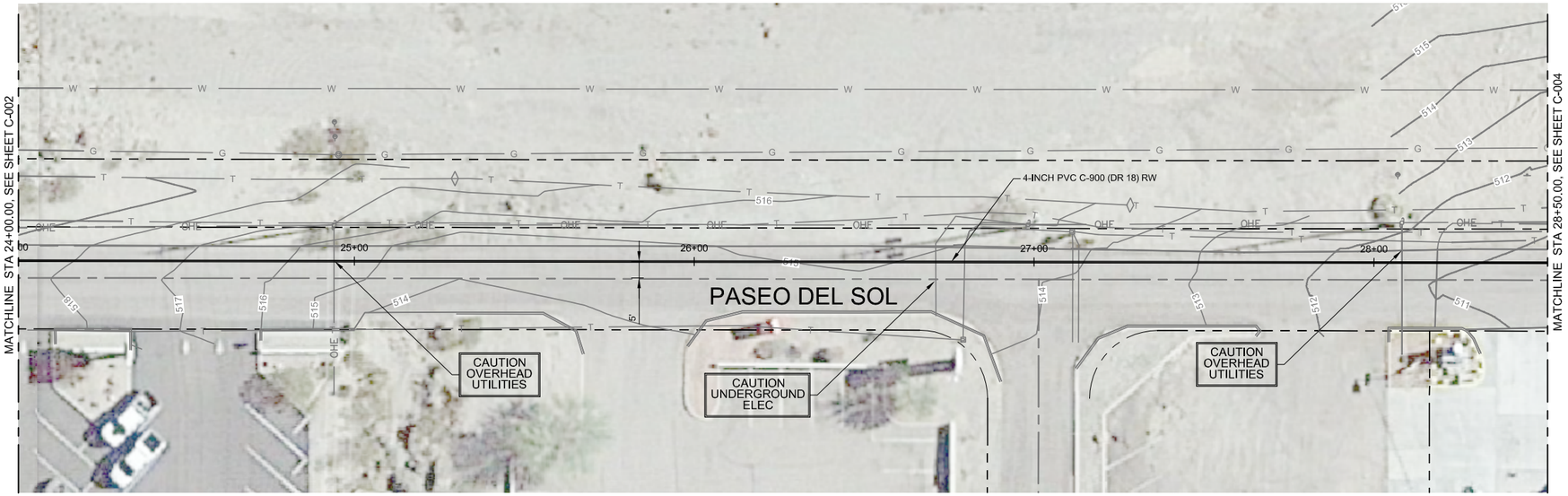

GENERAL NOTES

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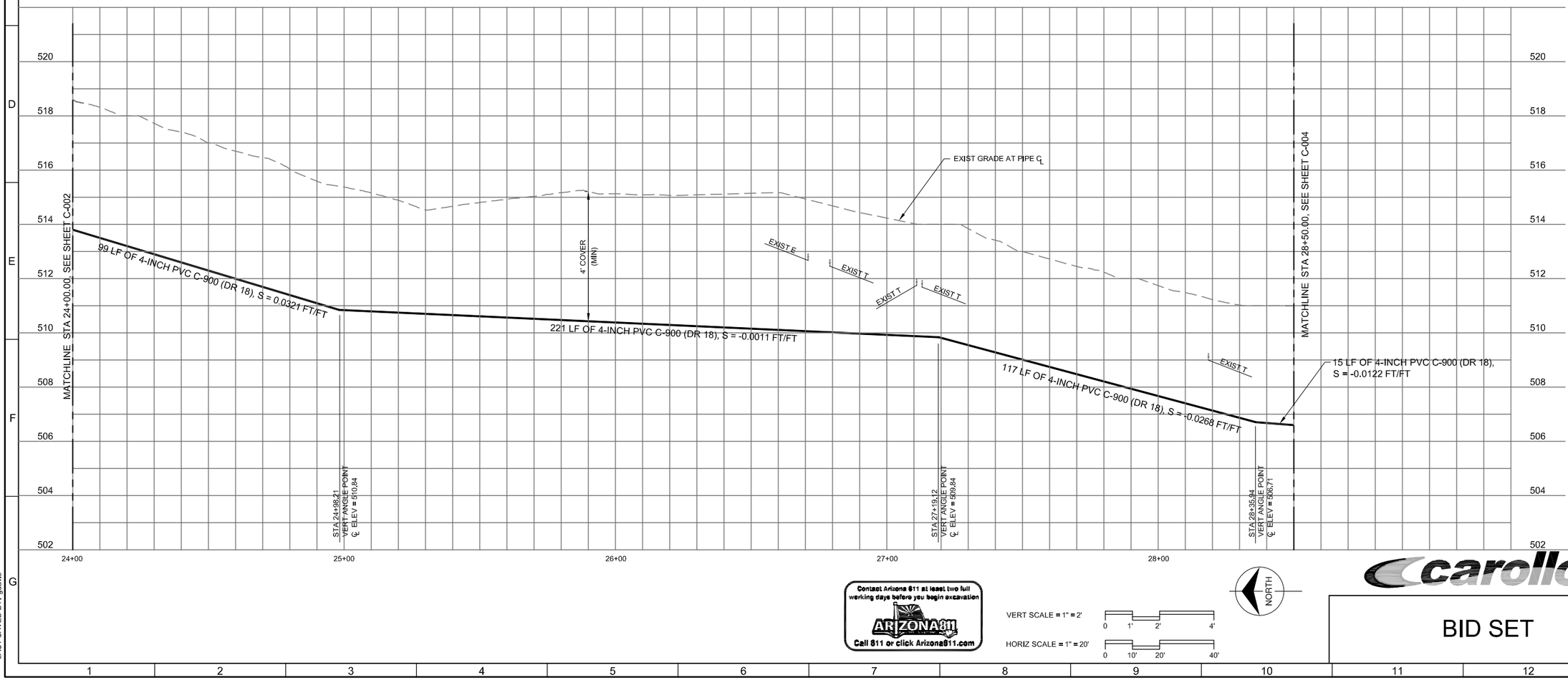
2. PAVEMENT CUTS FOR RECYCLED WATERLINE ARE TO BE RESTORED IN ACCORDANCE WITH CONTRACT DOCUMENTS.
3. ALL PIPE SHALL USE JOINT RESTRAINTS OR THRUST BLOCKS IN ACCORDANCE WITH SPECIFICATIONS AND PER (1 / C-019) AND (2 / C-019) UNLESS SHOWN OTHERWISE.
4. ALL BURIED PIPING SHALL HAVE A MINIMUM OF 4 FOOT OF COVER.
5. INSTALL BURIED PIPE PER SPECIFICATIONS AND (1 / C-018)
6. RECLAIMED WATER IRRIGATION SYSTEM, SPRINKLER HEADS, VALVE BOXES AND COVERS, AND FLOW CONTROL HANDLE ON VALVES SHALL BE PURPLE.
7. SEE SHEET NUMBERS C-021, C-022 AND C-023 FOR PARK SIGNAGE LOCATIONS.



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ARIZONA811
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VERT SCALE = 1" = 2'
HORIZ SCALE = 1" = 20'

NORTH

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

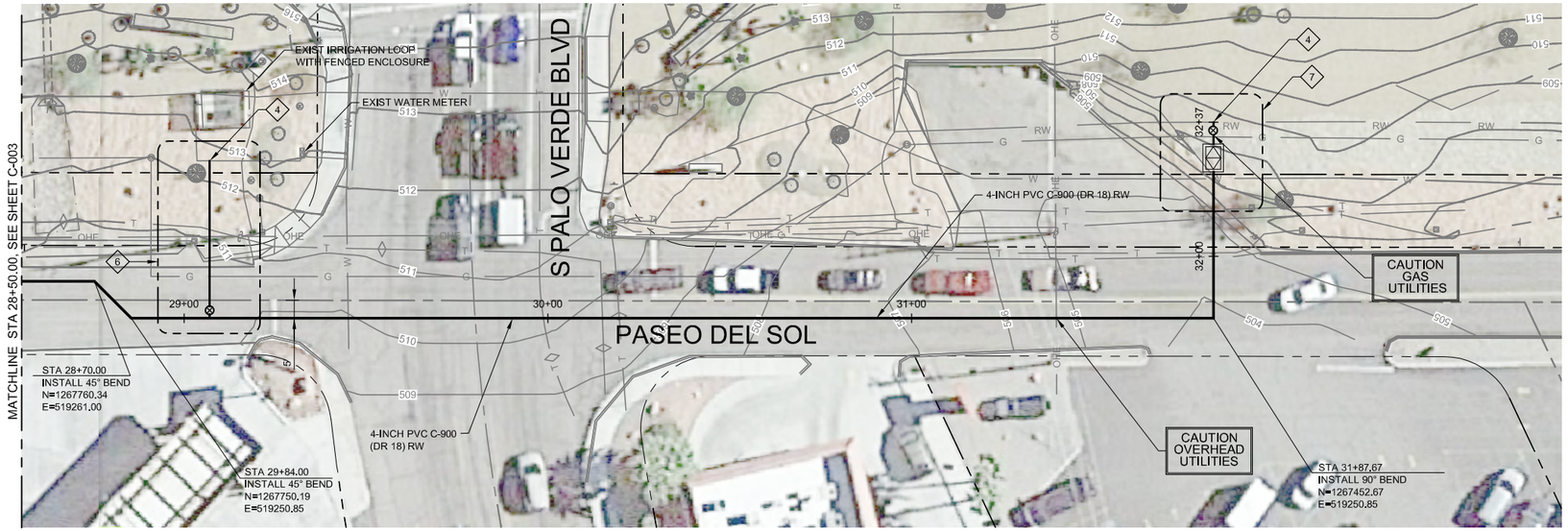
Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

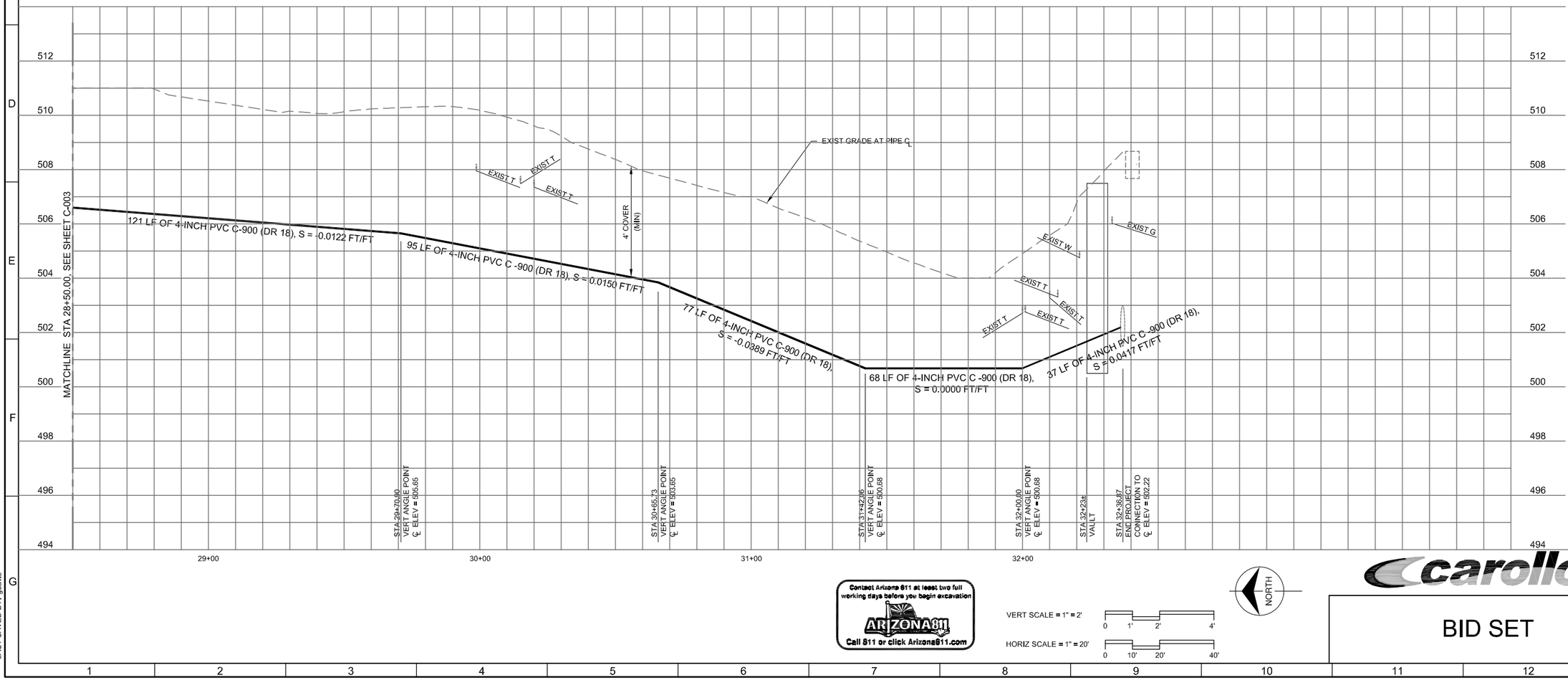
GENERAL
PASEO DEL SOL
PLAN AND PROFILE 2

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number:
C-003
Sheet 8 OF 43

LAST SAVED BY: gdavis





GENERAL NOTES

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5. INSTALL BURIED PIPE PER SPECIFICATIONS AND 1/C-018
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7. SEE SHEET NUMBERS C-021, C-022 AND C-023 FOR PARK SIGNAGE LOCATIONS.

KEY NOTES

4. CONTRACTOR SHALL COORDINATE EXACT TIE-IN LOCATION WITH OWNER IN THE FIELD PRIOR TO MAKING CONNECTION
6. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 4/C-013
7. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 5/C-013

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ARIZONA811
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NORTH

VERT SCALE = 1" = 2'
0 1' 2' 4'

HORIZ SCALE = 1" = 20'
0 10' 20' 40'

carollo

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

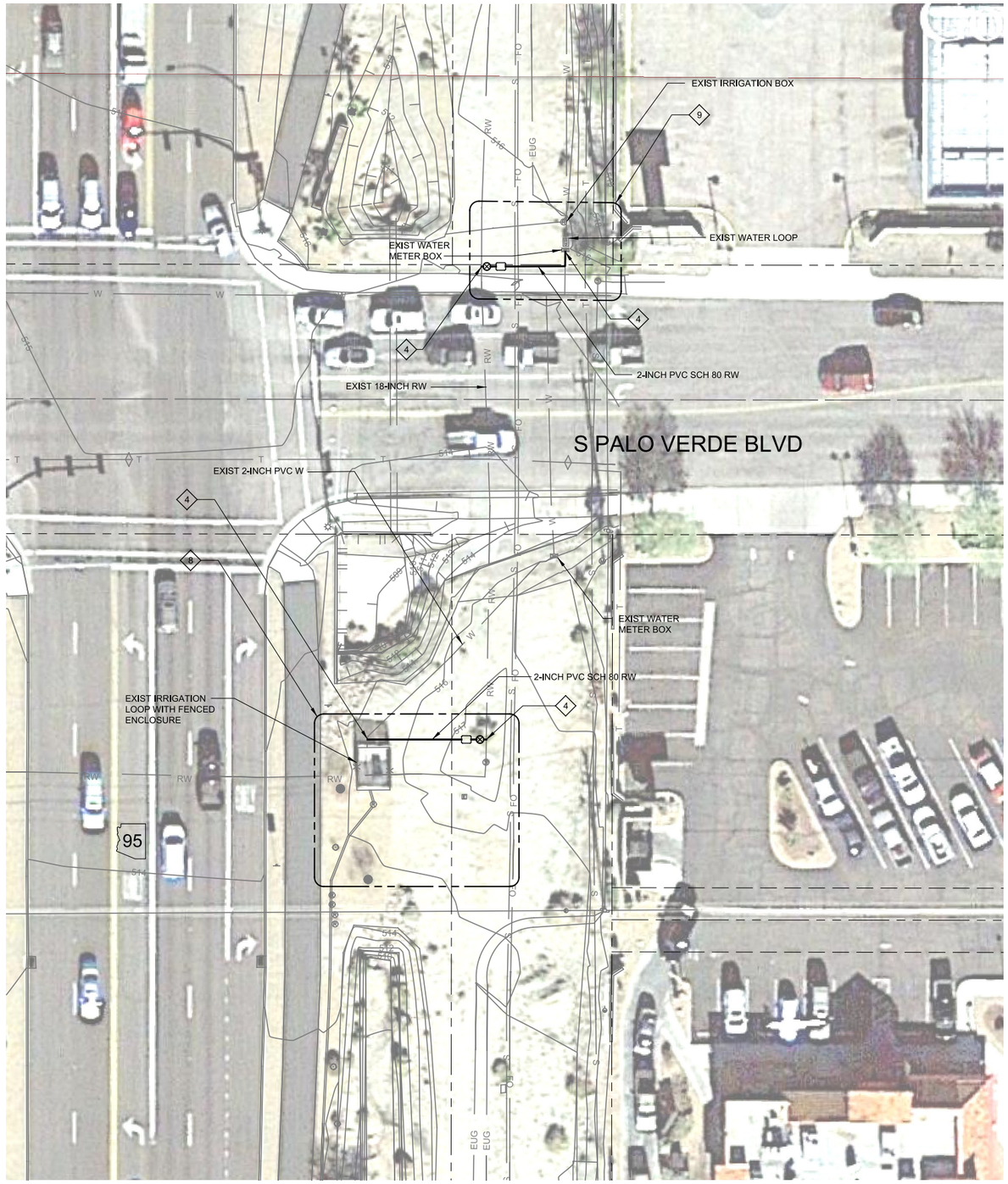
GENERAL
PASEO DEL SOL
PLAN AND PROFLE 3

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED 06-27-2016
ARIZONA, U.S.A.
EXPIRES 06-30-2018

BID SET

Sheet Number:
C-004
Sheet 9 OF 43

LAST SAVED BY: gdavis



GENERAL NOTES

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KEY NOTES

4. CONTRACTOR SHALL COORDINATE EXACT TIE-IN LOCATION WITH OWNER IN THE FIELD PRIOR TO MAKING CONNECTION
8. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 6/C-013
9. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH SALVAGE LOOP AND VALVE TO LAKE HAVASU CITY 1/C-014

NORTH

0 10' 20' 40'

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ARIZONA811 BLUE STAKE, INC.
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carollo

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

CIVIL
SITE PLAN
S PALO VERDE BLVD

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2018

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Sheet Number:
C-005
Sheet 10 OF 43

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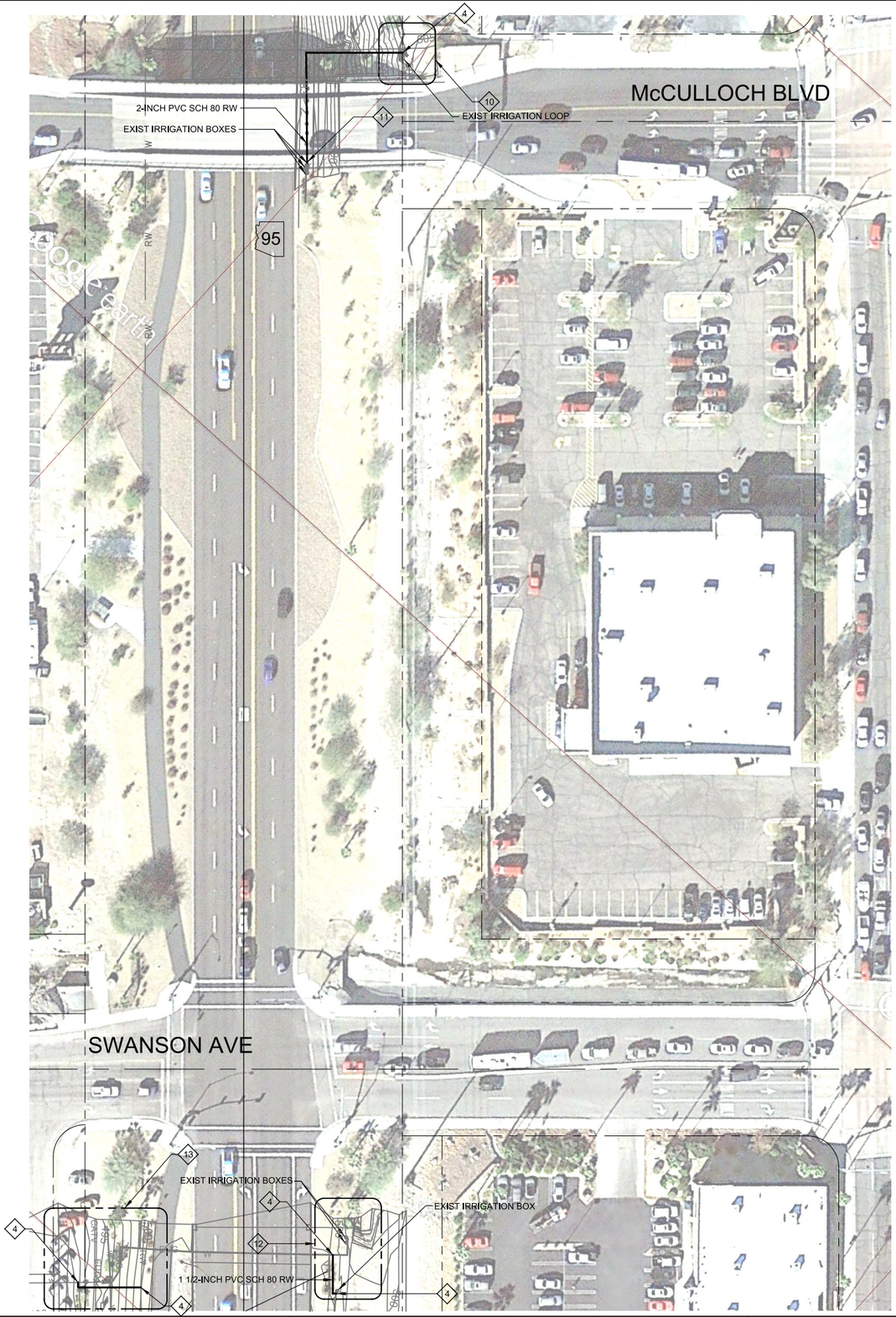

GENERAL NOTES

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7. SEE SHEET NUMBERS C-021, C-022 AND C-023 FOR PARK SIGNAGE LOCATIONS.

KEY NOTES

4. CONTRACTOR SHALL COORDINATE EXACT TIE-IN LOCATION WITH OWNER IN THE FIELD PRIOR TO MAKING CONNECTION
10. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 2 C-014
11. CONTRACTOR SHALL REMOVE CAP FROM EXIST 2" PVC W IN EXIST IRRIGATION BOX AND CONNECT RW TO EXIST PIPE
12. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 3 C-014
13. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 4 C-014

NORTH

0 20' 40' 80'

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

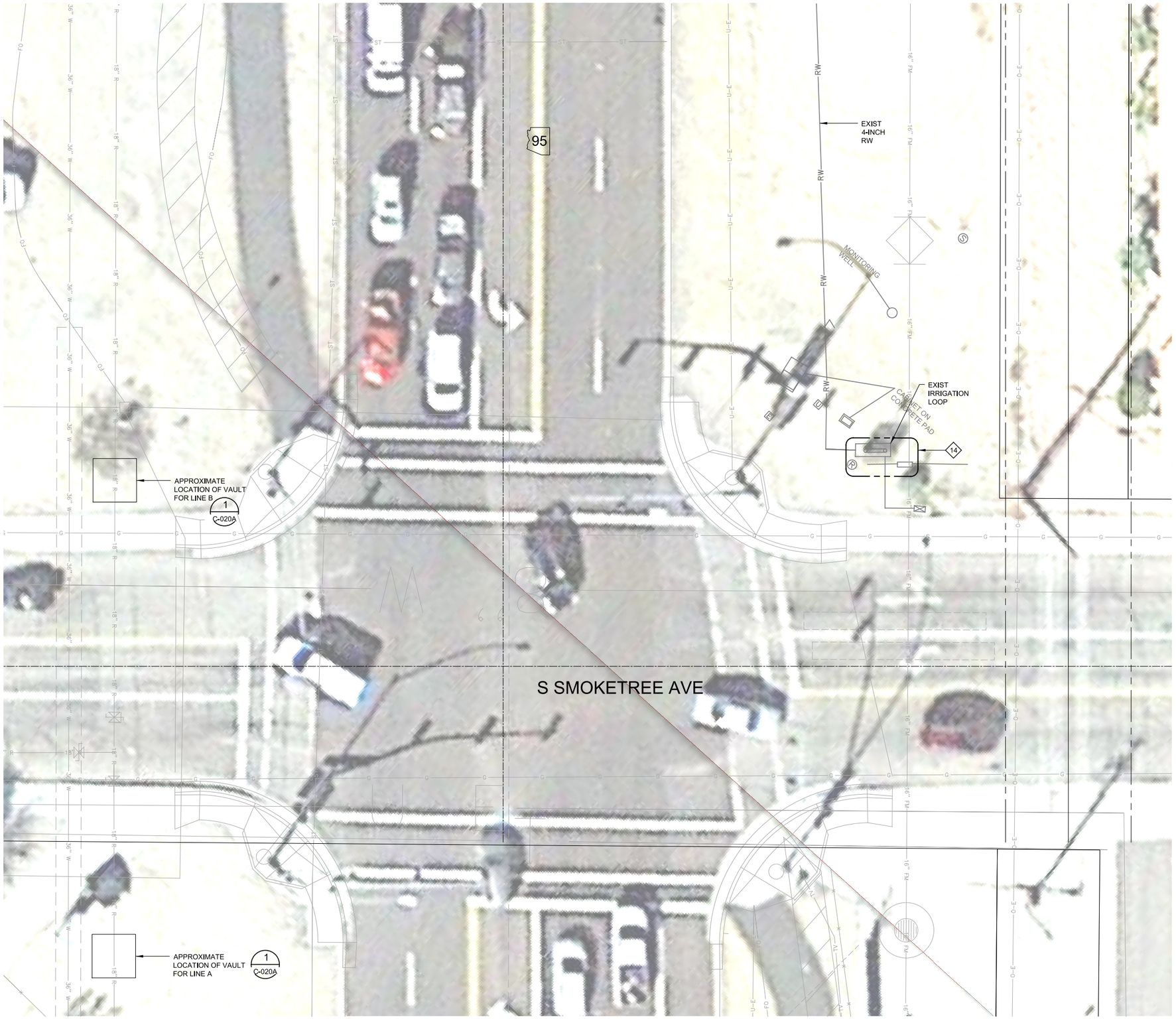
CIVIL
SITE PLAN
McCULLOCH BLVD N - SWANSON AVE

Registered Professional Engineer (Civil) CERTIFICATE NO. 44630 GREG A. GOULD DATE SIGNED 08/31/2016 ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number: C-006
Sheet 11 OF 43

LAST SAVED BY: gdavis

PROJECT NO. 9800A10 FILE NAME: P2-9800A10-C-006.dwg



GENERAL NOTES

1. SEE SHEET NUMBER G-002 AND G-003 FOR GENERAL CIVIL NOTES, OVERALL KEY NOTES, AND SPECIFICATION NOTES
2. PAVEMENT CUTS FOR RECYCLED WATERLINE ARE TO BE RESTORED IN ACCORDANCE WITH CONTRACT DOCUMENTS.
3. ALL PIPE SHALL USE JOINT RESTRAINTS OR THRUST BLOCKS IN ACCORDANCE WITH SPECIFICATIONS AND PER 1 C-019 AND 2 C-019 UNLESS SHOWN OTHERWISE.
4. ALL BURIED PIPING SHALL HAVE A MINIMUM OF 4 FOOT OF COVER.
5. INSTALL BURIED PIPE PER SPECIFICATIONS AND 1 C-018 .
6. RECLAIMED WATER IRRIGATION SYSTEM, SPRINKLER HEADS, VALVE BOXES AND COVERS, AND FLOW CONTROL HANDLE ON VALVES SHALL BE PURPLE.
7. SEE SHEET NUMBERS C-021, C-022 AND C-022 FOR PARK SIGNAGE LOCATIONS.
8. VAULT LOCATIONS ARE APPROXIMATE, CONTRACTOR TO VERIFY LOCATIONS IN THE FIELD.

KEY NOTES

14 INSTALL CAP AND REMOVE EXIST IRRIGATION LOOP AND VALVE IN ACCORDANCE WITH SALVAGE LOOP AND VALVE TO LAKE HAVASU CITY 5 C-014

NORTH

0 5' 10' 20'

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

CIVIL
SITE PLAN
SMOKETREE AVE

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2018

BID SET

Sheet Number:
C-007
Sheet 12 OF 43

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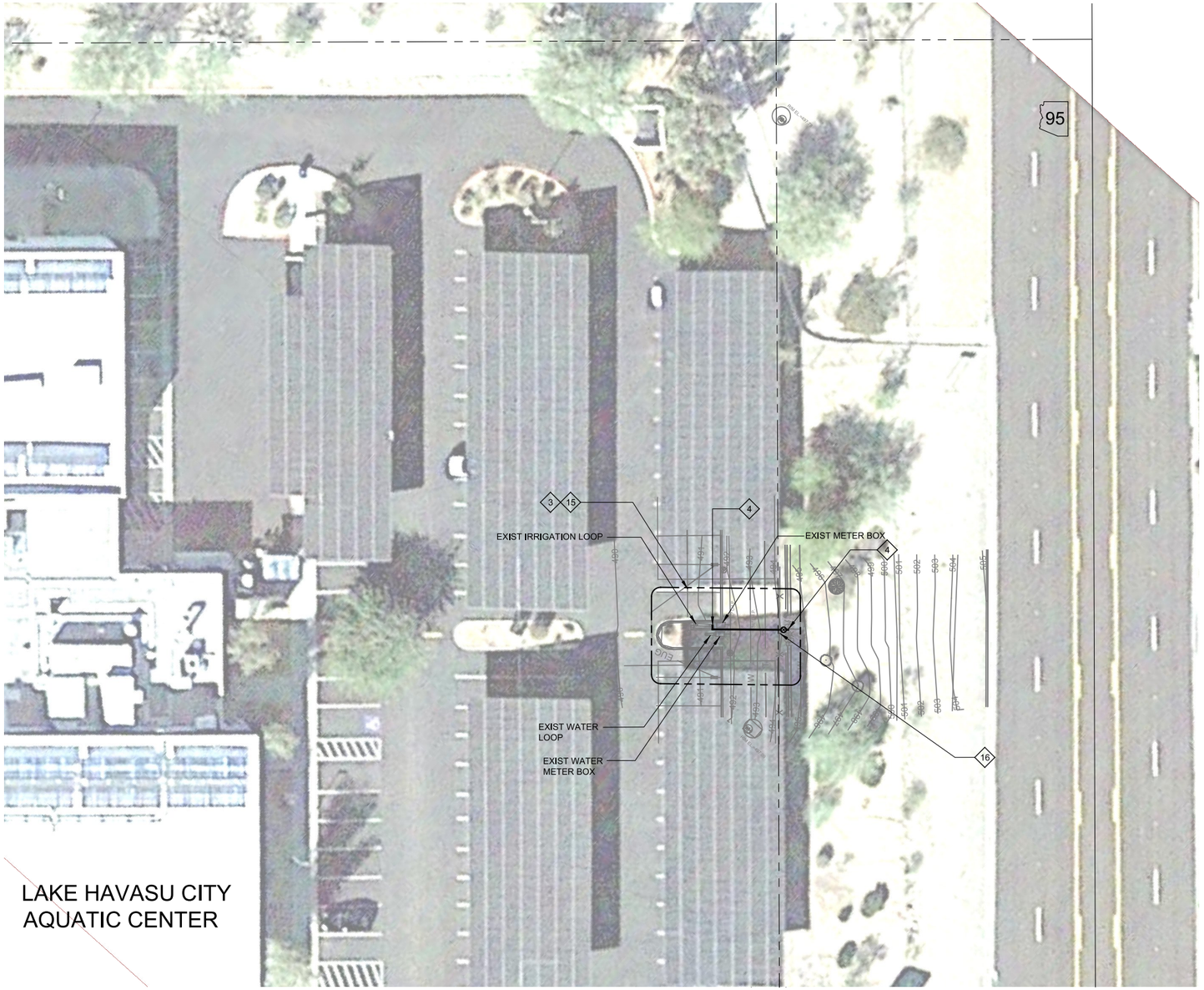

GENERAL NOTES

1. SEE SHEET NUMBER G-002 AND G-003 FOR GENERAL CIVIL NOTES, OVERALL KEY NOTES, AND SPECIFICATION NOTES
2. PAVEMENT CUTS FOR RECYCLED WATERLINE ARE TO BE RESTORED IN ACCORDANCE WITH CONTRACT DOCUMENTS.
3. ALL PIPE SHALL USE JOINT RESTRAINTS OR THRUST BLOCKS IN ACCORDANCE WITH SPECIFICATIONS AND PER 1 C-019 AND 2 C-019 UNLESS SHOWN OTHERWISE.
4. ALL BURIED PIPING SHALL HAVE A MINIMUM OF 4 FOOT OF COVER.
5. INSTALL BURIED PIPE PER SPECIFICATIONS AND 1 C-018 .
6. RECLAIMED WATER IRRIGATION SYSTEM, SPRINKLER HEADS, VALVE BOXES AND COVERS, AND FLOW CONTROL HANDLE ON VALVES SHALL BE PURPLE.
7. SEE SHEET NUMBERS C-021, C022 AND C-023 FOR PARK SIGNAGE LOCATIONS.

KEY NOTES

3. UPON COMPLETION OF REUSE WATER PIPELINE AND CONNECTION INSTALLATION, CONTRACTOR SHALL PERFORM A DYE TEST. A LHC ENGINEERING DIVISION REPRESENTATIVE MUST BE PRESENT DURING THE DYE TEST. CONTRACTOR SHALL NOTIFY THE LHC ENGINEERING DIVISION (24) HOURS PRIOR TO THE DYE TEST BY TELEPHONE AT (928)453-4148
4. CONTRACTOR SHALL COORDINATE EXACT TIE-IN LOCATION WITH OWNER IN THE FIELD PRIOR TO MAKING CONNECTION
15. CONNECT TIE-IN TO EXIST PIPELINE IN ACCORDANCE WITH 1 C-015
16. CONTRACTOR SHALL REMOVE AND REPLACE INTERFERING PORTION OF EXIST FENCE IN KIND AND AS NEEDED TO ACCOMMODATE PIPE INSTALLATION

NORTH

0 10' 20' 40'

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PROJECT NO. 9800A10 FILE NAME: P2-9800A10-C-008.dwg

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

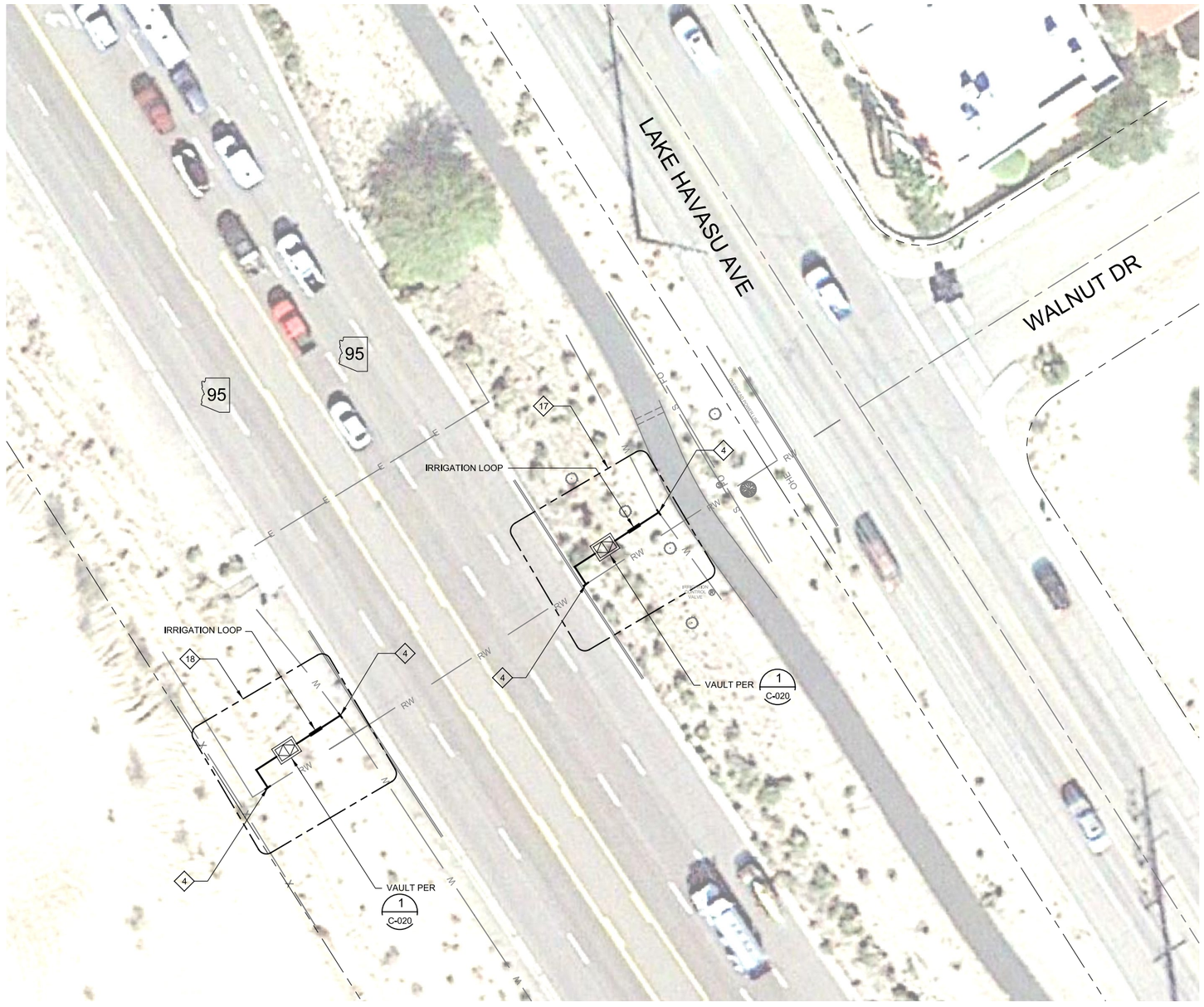
LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: GG
Drawn by: GD
Checked by: JW
Date: AUGUST 2016
Dwg scale:

CIVIL
LAKE HAVASU CITY
AQUATIC CENTER

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number:
C-008
Sheet 13 OF 43



GENERAL NOTES

1. SEE SHEET NUMBER G-002 AND G-003 FOR GENERAL CIVIL NOTES, OVERALL KEY NOTES, AND SPECIFICATION NOTES
2. PAVEMENT CUTS FOR RECYCLED WATERLINE ARE TO BE RESTORED IN ACCORDANCE WITH CONTRACT DOCUMENTS.
3. ALL PIPE SHALL USE JOINT RESTRAINTS OR THRUST BLOCKS IN ACCORDANCE WITH SPECIFICATIONS AND PER 1 C-019 AND 2 C-019 UNLESS SHOWN OTHERWISE.
4. ALL BURIED PIPING SHALL HAVE A MINIMUM OF 4 FOOT OF COVER.
5. INSTALL BURIED PIPE PER SPECIFICATIONS AND 1 C-018.
6. RECLAIMED WATER IRRIGATION SYSTEM, SPRINKLER HEADS, VALVE BOXES AND COVERS, AND FLOW CONTROL HANDLE ON VALVES SHALL BE PURPLE.
7. SEE SHEET NUMBERS C-021, C-022 AND C-023 FOR PARK SIGNAGE LOCATIONS.

KEY NOTES

4 CONTRACTOR SHALL COORDINATE EXACT TIE-IN LOCATION WITH OWNER IN THE FIELD PRIOR TO MAKING CONNECTION

17 CONNECT TIE-IN TO EXIST PIPELINE AND INSTALL PIPE LOOP IN ACCORDANCE WITH 2 C-015

18 CONNECT TIE-IN TO EXIST PIPELINE AND INSTALL PIPE LOOP IN ACCORDANCE WITH 2 C-015

NORTH

0 10' 20' 40'

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

CIVIL
SITE PLAN
WALNUT DR

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A.
GOULD
DATE SIGNED 08/31/2016
ARIZONA, U.S.A.
EXPIRES 06-30-2018

BID SET

Sheet Number:
C-009
Sheet 14 OF 43

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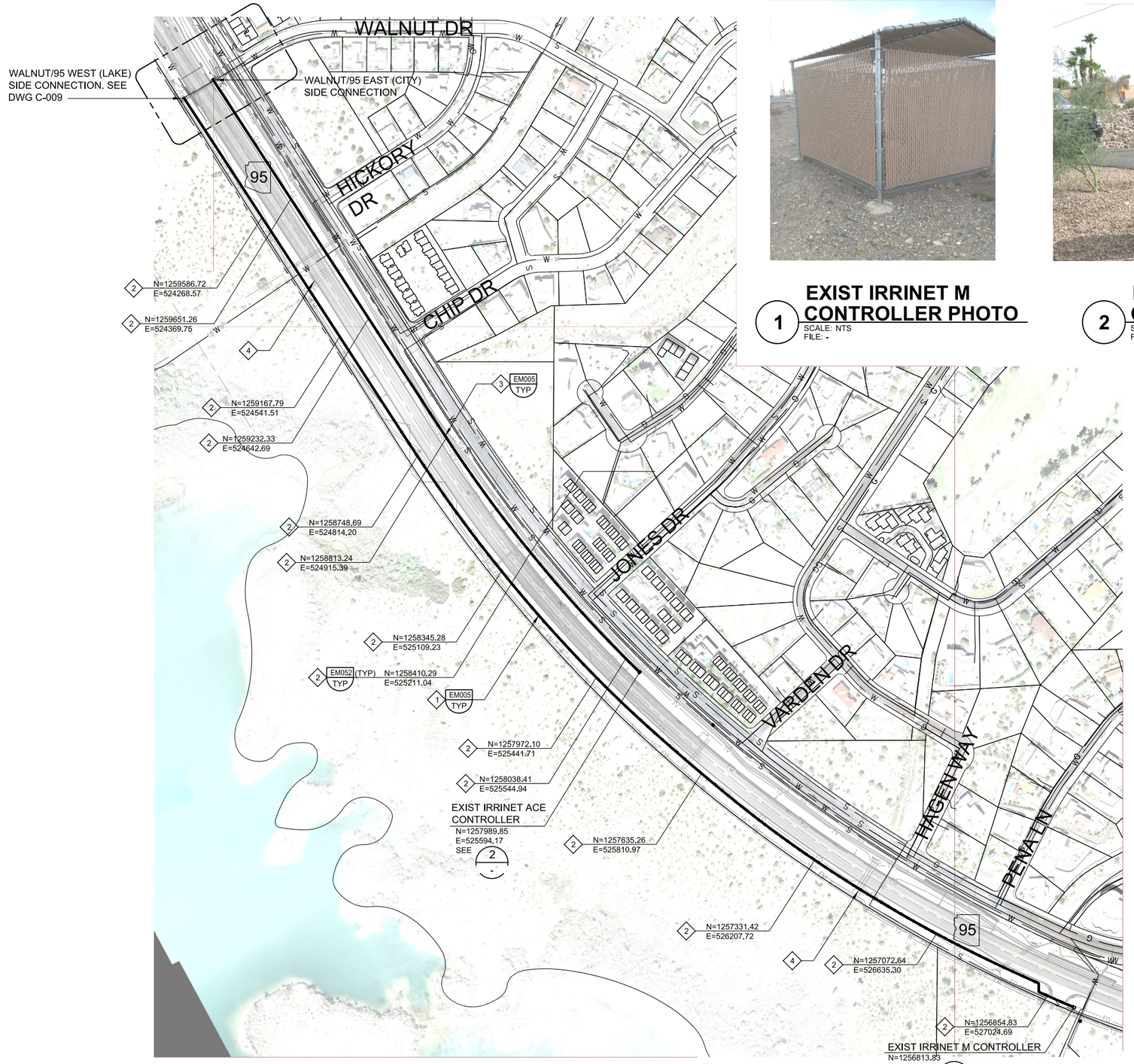

1 EXIST IRRINET M CONTROLLER PHOTO
SCALE: NTS
FILE: -

2 EXIST IRRINET ACE CONTROLLER PHOTO
SCALE: NTS
FILE: -

GENERAL NOTES:

1. ALL MEASUREMENTS OF EXISTING TOPOGRAPHY, STRUCTURES, COORDINATE POINTS AND UTILITIES ARE SUBJECT TO VERIFICATION IN THE FIELD BY THE CONTRACTOR. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE DRAWINGS PRIOR TO FABRICATION OR CONSTRUCTION. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ERRORS, WHICH MAY HAVE BEEN AVOIDED BY FIELD VERIFICATION.
2. DO NOT INTERRUPT EXISTING UTILITIES SERVING OCCUPIED OR USED FACILITIES, EXCEPT WHEN AUTHORIZED BY THE ENGINEER. PROVIDE TEMPORARY SERVICES DURING INTERRUPTIONS TO EXISTING UTILITIES AS REQUIRED.
3. REPLACE IN KIND ALL EXISTING STRUCTURES, PAVING AND LANDSCAPING DISTURBED BY CONSTRUCTION UNLESS NOTED OTHERWISE.
4. EXISTING UTILITIES ARE SHOWN PER THE RECORD DRAWINGS. POTHOLE AT ALL POINTS OF CROSSINGS & CONNECTIONS TO VERIFY DEPTHS, PIPE MATERIAL & SIZE. NOTIFY OWNER OF ANY DISCREPANCIES WHICH MAY IMPACT PIPE ALIGNMENTS.
5. COORDINATE WITH THE OWNER TO PROGRAM EXISTING IRRINET M AND IRRINET ACE IRRIGATION CONTROLLERS.

KEY NOTES

1. PROVIDE A 1-INCH PVC40 CONDUIT WITH 5-#8 AND 1-#10(G).
2. PROVIDE JENSEN PRECAST NO. 3-1/2 ELECTRICAL PULL BOX MEETING ADOT NO. 3-1/2 SPECIFICATION. BOX SHALL BE CATALOG NUMBER CYN9 AND LID SHALL BE CATALOG NUMBER CYN9CJ WITH MARKING "IRRIGATION CONTROL". PROVIDE EXTENSIONS AS NEEDED FOR FINAL INSTALLATION. EXTENSION SHALL BE CATALOG NUMBER CYN9E
3. PROVIDE A 1-INCH PVC40 CONDUIT WITH 5-#10 AND 1-#10(G).
4. EXISTING SCUPPER, REPLACE IN KIND. 2 PLACES, CONTRACTOR TO VERIFY

NORTH
0 100' 200' 400'

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BID SET

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

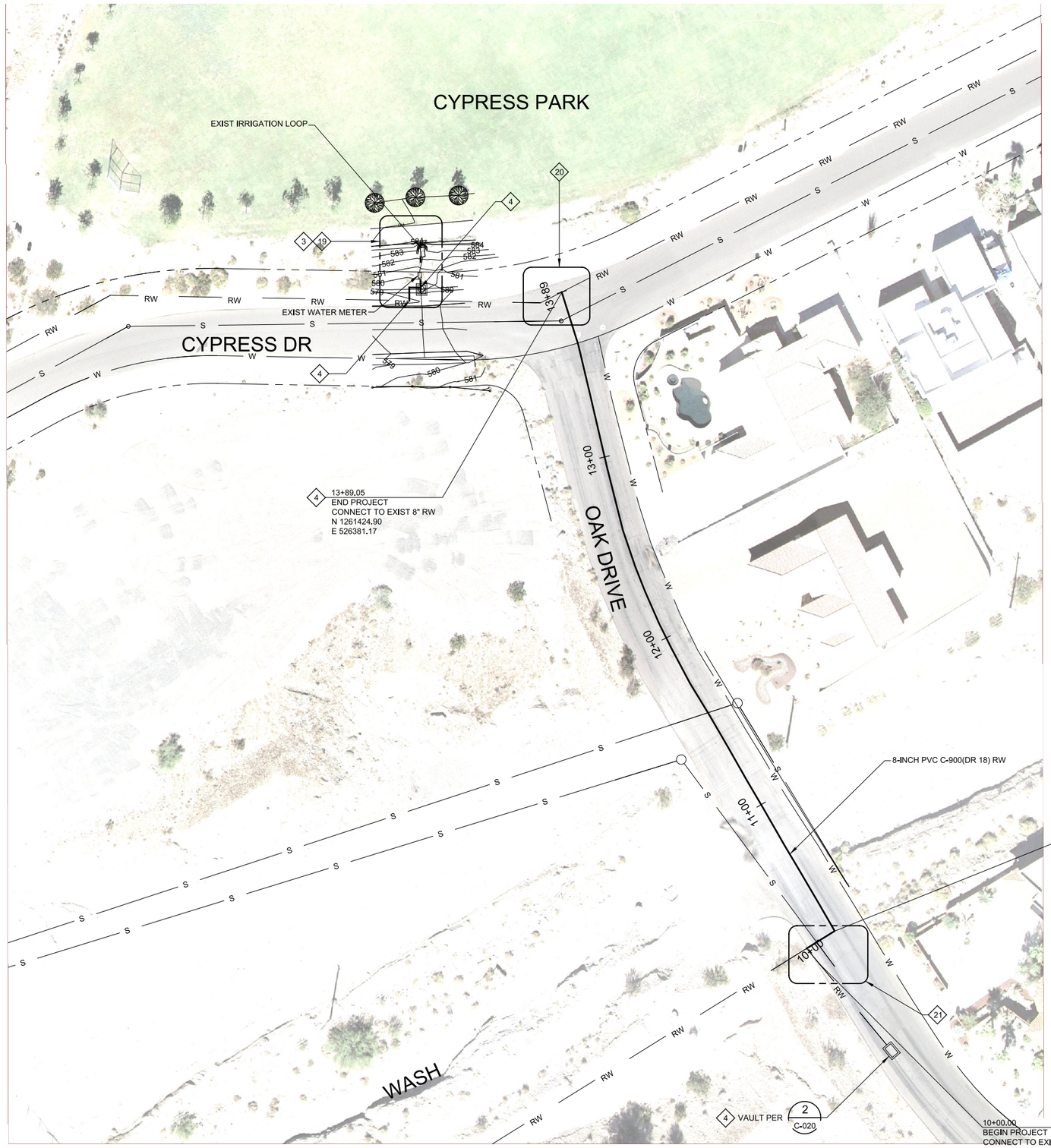
Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

CIVIL
SITE PLAN
WALNUT DR
TO CONTROLLERS

REGISTERED PROFESSIONAL ENGINEER
CERTIFICATE NO.
57417
KELI A. CALLAHAN
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2017

Sheet Number:
C-009A
Sheet 15 OF 43

LAST SAVED BY: gdavis
PROJECT NO. 9800A10
FILE NAME:



GENERAL NOTES

1. SEE SHEET NUMBER G-002 AND G-003 FOR GENERAL CIVIL NOTES, OVERALL KEY NOTES, AND SPECIFICATION NOTES
2. PAVEMENT CUTS FOR RECYCLED WATERLINE ARE TO BE RESTORED IN ACCORDANCE WITH CONTRACT DOCUMENTS.
3. ALL PIPE SHALL USE JOINT RESTRAINTS OR THRUST BLOCKS IN ACCORDANCE WITH SPECIFICATIONS AND PER 1 C-019 AND 2 C-019 UNLESS SHOWN OTHERWISE.
4. ALL BURIED PIPING SHALL HAVE A MINIMUM OF 4 FOOT OF COVER.
5. INSTALL BURIED PIPE PER SPECIFICATIONS AND 1 C-018 .
6. RECLAIMED WATER IRRIGATION SYSTEM, SPRINKLER HEADS, VALVE BOXES AND COVERS, AND FLOW CONTROL HANDLE ON VALVES SHALL BE PURPLE.
7. SEE SHEET NUMBERS C-021, C022 AND C-023 FOR PARK SIGNAGE LOCATIONS.

KEY NOTES

3. UPON COMPLETION OF REUSE WATER PIPELINE AND CONNECTION INSTALLATION, CONTRACTOR SHALL PERFORM A DYE TEST. A LHC ENGINEERING DIVISION REPRESENTATIVE MUST BE PRESENT DURING THE DYE TEST. CONTRACTOR SHALL NOTIFY THE LHC ENGINEERING DIVISION (24) HOURS PRIOR TO THE DYE TEST BY TELEPHONE AT (928)453-4148
4. CONTRACTOR SHALL COORDINATE EXACT TIE-IN LOCATION WITH OWNER IN THE FIELD PRIOR TO MAKING CONNECTION
19. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 1 C-016
20. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 2 C-016
21. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 3 C-016

NORTH

0 10' 20' 30' 60'

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ARIZONA811 BLUE STAKE, INC.
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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

CIVIL
SITE PLAN
CYPRESS
PARK

Registered Professional Engineer (Civil) CERTIFICATE NO. 44630 GREG A. GOULD DATE SIGNED 06/21/2016 ARIZONA, U.S.A.
EXPIRES 06-30-2018

BID SET

Sheet Number: C-010

Sheet 16 OF 43

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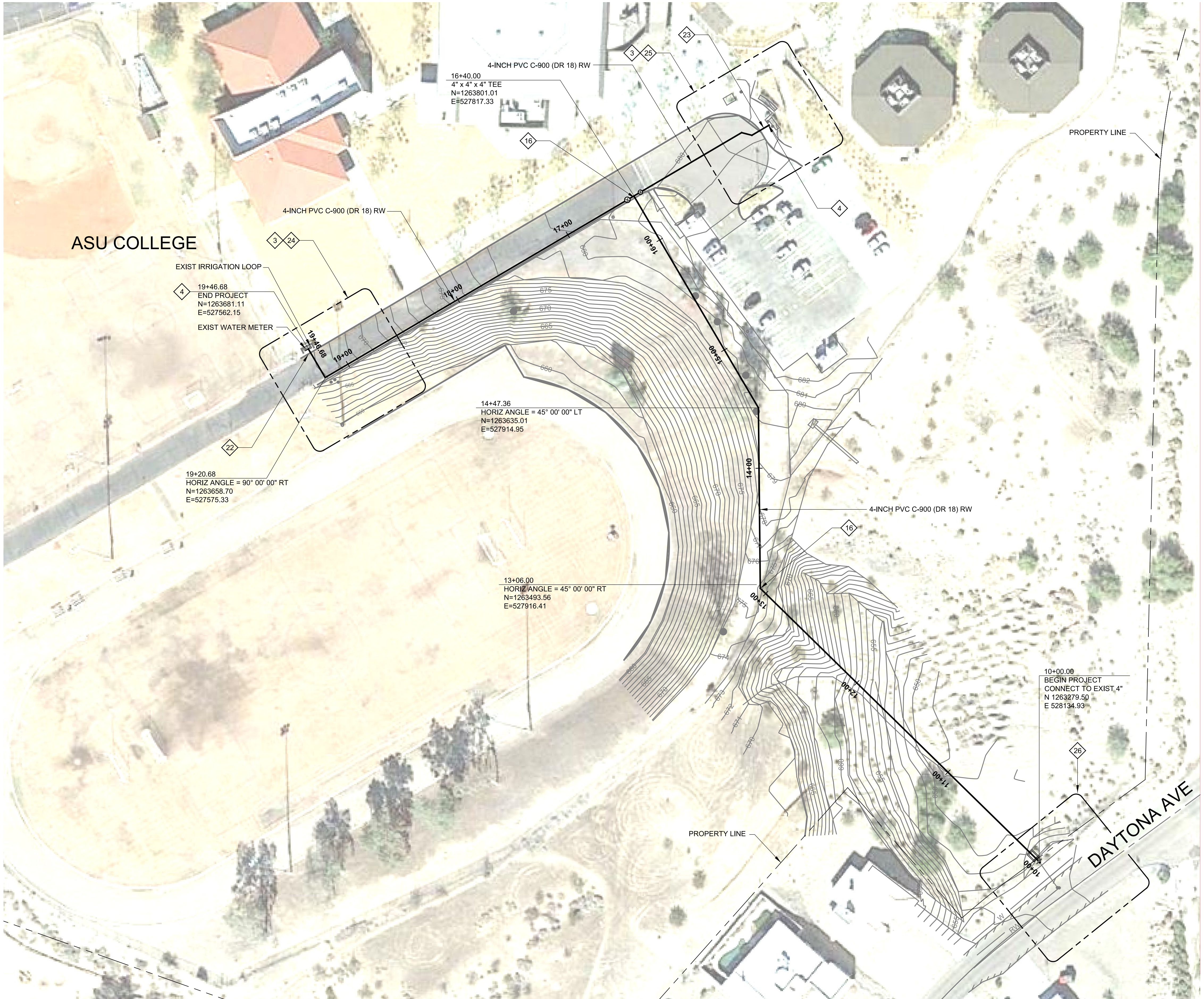
PROJECT NO. 9800A10 FILE NAME: P2-9800A10-C-010.dwg



GENERAL NOTES

1. SEE SHEET NUMBER G-002 AND G-003 FOR GENERAL CIVIL NOTES, OVERALL KEY NOTES, AND SPECIFICATION NOTES
2. PAVEMENT CUTS FOR RECYCLED WATERLINE ARE TO BE RESTORED IN ACCORDANCE WITH CONTRACT DOCUMENTS.
3. ALL PIPE SHALL USE JOINT RESTRAINTS OR THRUST BLOCKS IN ACCORDANCE WITH SPECIFICATIONS AND PER 1/C-019 AND 2/C-019 UNLESS SHOWN OTHERWISE.
4. ALL BURIED PIPING SHALL HAVE A MINIMUM OF 4 FOOT OF COVER.
5. INSTALL BURIED PIPE PER SPECIFICATIONS AND 1/C-018.
6. RECLAIMED WATER IRRIGATION SYSTEM, SPRINKLER HEADS, VALVE BOXES AND COVERS, AND FLOW CONTROL HANDLE ON VALVES SHALL BE PURPLE.
7. SEE SHEET NUMBERS C-021, C-022 AND C-023 FOR PARK SIGNAGE LOCATIONS.

KEY NOTES

3. UPON COMPLETION OF REUSE WATER PIPELINE AND CONNECTION INSTALLATION, CONTRACTOR SHALL PERFORM A DYE TEST. A LHC ENGINEERING DIVISION REPRESENTATIVE MUST BE PRESENT DURING THE DYE TEST. CONTRACTOR SHALL NOTIFY THE LHC ENGINEERING DIVISION (24) HOURS PRIOR TO THE DYE TEST BY TELEPHONE AT (928)453-4148
4. CONTRACTOR SHALL COORDINATE EXACT TIE-IN LOCATION WITH OWNER IN THE FIELD PRIOR TO MAKING CONNECTION
16. CONTRACTOR SHALL REMOVE AND REPLACE INTERFERING PORTION OF EXISTING FENCE IN KIND AND AS NEEDED TO ACCOMMODATE PIPE INSTALLATION
22. CONTRACTOR SHALL REMOVE AND REPLACE INTERFERING PORTION OF EXISTING CURB IN KIND AS NEEDED TO ACCOMMODATE PIPE INSTALLATION AND IN ACCORDANCE WITH SECTION 03310
23. CONTRACTOR SHALL REMOVE AND REPLACE INTERFERING PORTION OF EXISTING SIDEWALK, CURB AND GUTTER IN KIND AND AS NEEDED TO ACCOMMODATE PIPE INSTALLATION AND IN ACCORDANCE WITH SECTION 03310
24. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 1/C-017
25. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 2/C-017
26. CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 3/C-017

NORTH

0 20' 40' 80'

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LAKE HAVASU CITY®

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: GG
Drawn by: GD
Checked by: JW
Date: AUGUST 2016
Dwg scale:

GENERAL
SITE PLAN
ASU CAMPUS

Registered Professional Engineer (Civil)
CERTIFICATE NO. 44630
GREG A. GOULD
DATE SIGNED 08/31/2016
ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number:
C-011

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PROJECT NO. 9800A10 FILE NAME: P2-9800A10-C-011.dwg

GENERAL NOTES

1. SEE SHEET NUMBER G-002 AND G-003 FOR GENERAL CIVIL NOTES, OVERALL KEY NOTES, AND SPECIFICATION NOTES
2. PAVEMENT CUTS FOR RECYCLED WATERLINE ARE TO BE RESTORED IN ACCORDANCE WITH CONTRACT DOCUMENTS.
3. ALL PIPE SHALL USE JOINT RESTRAINTS OR THRUST BLOCKS IN ACCORDANCE WITH SPECIFICATIONS AND PER 1/C-019 AND 2/C-019 UNLESS SHOWN OTHERWISE.
4. ALL BURIED PIPING SHALL HAVE A MINIMUM OF 4 FOOT OF COVER.
5. INSTALL BURIED PIPE PER SPECIFICATIONS AND 1/C-018.
6. RECLAIMED WATER IRRIGATION SYSTEM, SPRINKLER HEADS, VALVE BOXES AND COVERS, AND FLOW CONTROL HANDLE ON VALVES SHALL BE PURPLE.
7. SEE SHEET NUMBERS C-021, C-022 AND C-023 FOR PARK SIGNAGE LOCATIONS.

KEY NOTES

◇3 UPON COMPLETION OF REUSE WATER PIPELINE AND CONNECTION INSTALLATION, CONTRACTOR SHALL PERFORM A DYE TEST, A LHC ENGINEERING DIVISION REPRESENTATIVE MUST BE PRESENT DURING THE DYE TEST. CONTRACTOR SHALL NOTIFY THE LHC ENGINEERING DIVISION (24) HOURS PRIOR TO THE DYE TEST BY TELEPHONE AT (928)453-4148

◇4 CONTRACTOR SHALL COORDINATE EXACT TIE-IN LOCATION WITH OWNER IN THE FIELD PRIOR TO MAKING CONNECTION

◇11 CONTRACTOR SHALL REMOVE CAP FROM EXIST 2" PVC W IN EXIST IRRIGATION BOX AND CONNECT RW TO EXIST PIPE

◇27 CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 4/C-017

◇28 CONSTRUCT TIE-IN TO EXISTING PIPELINE IN ACCORDANCE WITH 5/C-017

NORTH

0 20' 40' 80'

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

GENERAL
SITE PLAN
JACK HARDIE PARK

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED 08/31/2016
ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number:
C-012

Sheet 18 OF 43

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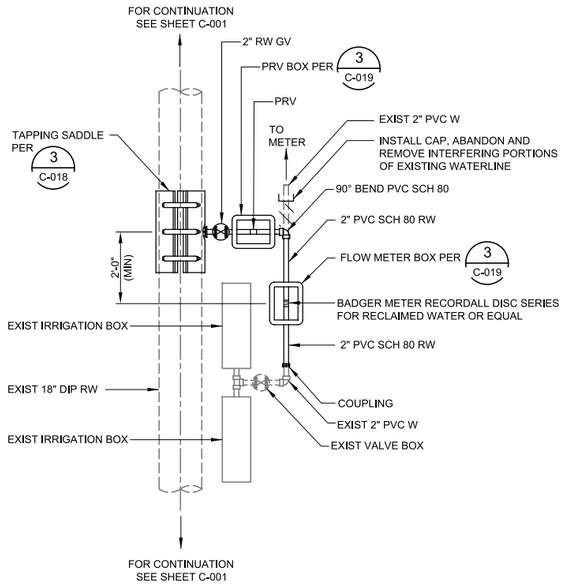
PROJECT NO. 9800A10 FILE NAME: P2-9800A10-C-012.dwg



1 C-001 DETAIL AT W ACOMA BLVD TO INDUSTRIAL BLVD

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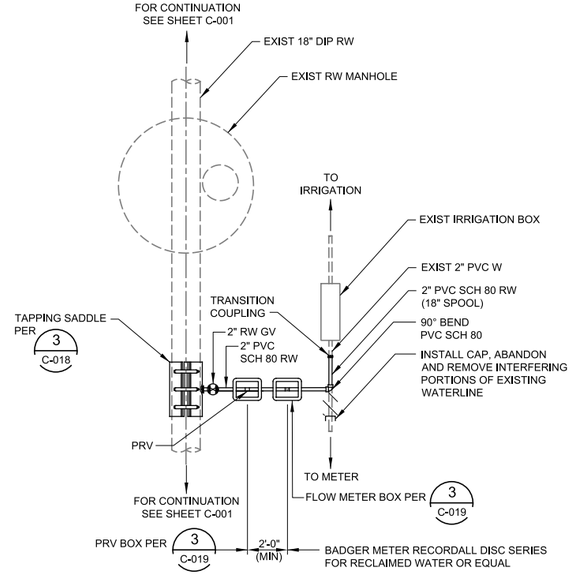

2 C-001 DETAIL AT W ACOMA BLVD TO INDUSTTRIAL BLVD

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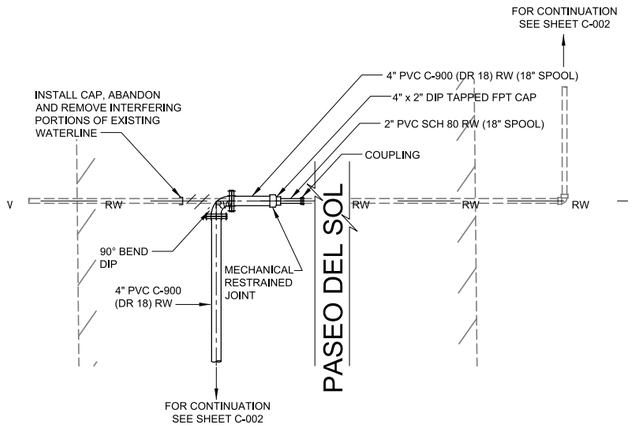
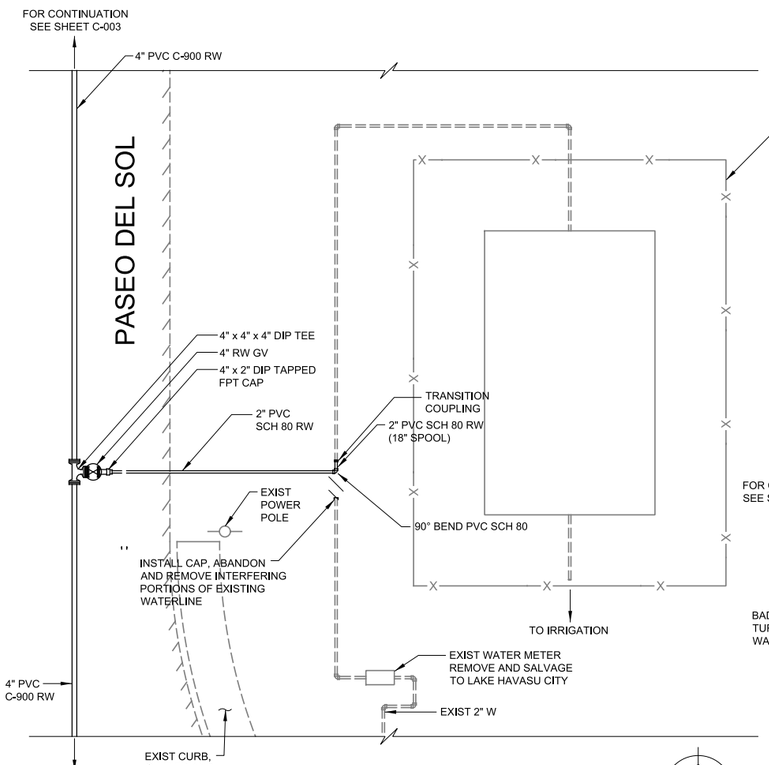


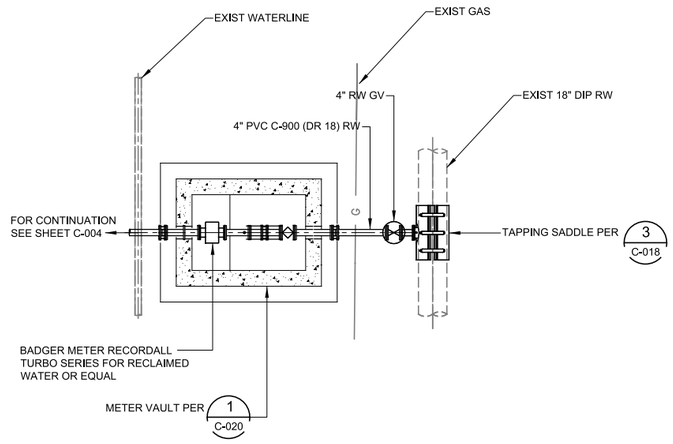
3 C-002 DETAIL AT PASEO DEL SOL

SCALE: NTS
FILE: -



4 C-004 DETAIL AT PASEO DEL SOL

SCALE: NTS
FILE: -



5 C-004 DETAIL AT PASEO DEL SOL

SCALE: NTS
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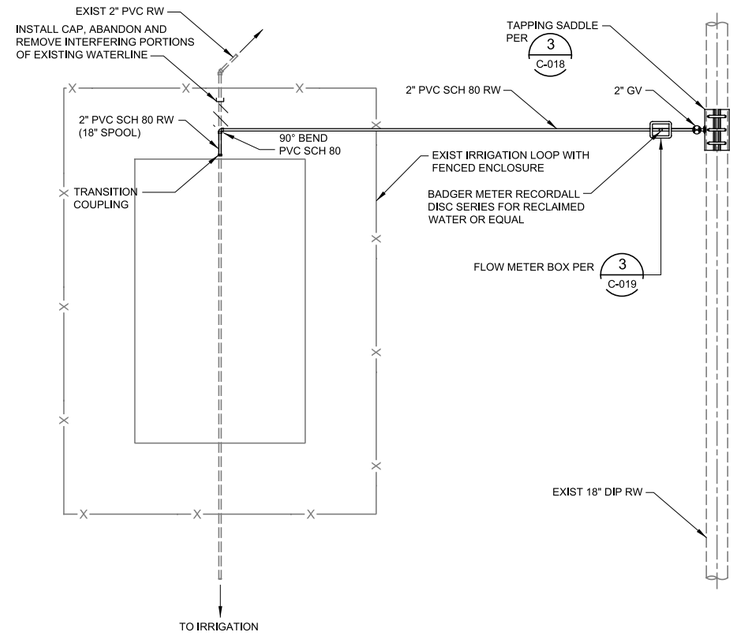

6 C-005 DETAIL AT S PALO VERDE BLVDS

SCALE: NTS
FILE: -

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: GG
Drawn by: GD
Checked by: JW
Date: AUGUST 2016
Dwg scale:

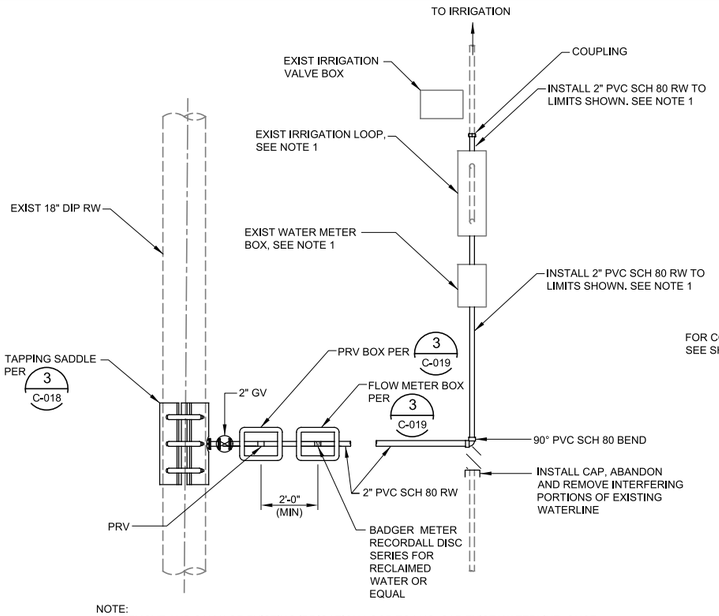
CIVIL
DETAILS 1

Registered Professional Engineer (Civil) CERTIFICATE NO. 44630 GREG A. GOULD DATE SIGNED ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number: C-013
Sheet 19 OF 43

LAST SAVED BY: AArroyo

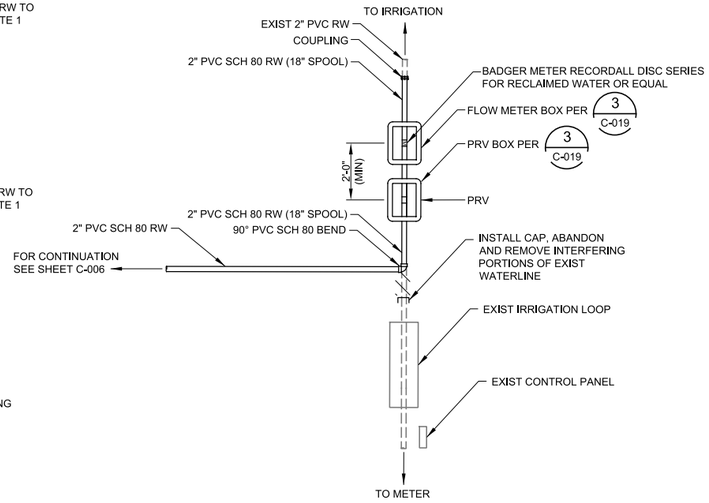
PROJECT NO. 9800A10 FILE NAME: P2-9800A10_C-013.dwg



NOTE:
1. REMOVE AND SALVAGE EXISTING IRRIGATION LOOP TO LHC. CAP EXIST WATERLINE. ONCE EXIST METER AND IRRIGATION LOOP AND CONCRETE PAD ARE REMOVED, INSTALL 2" PVC SCH 80 RW FROM 90° BEND TO COUPLING AS SHOWN.

1 C-005 DETAIL AT PALO VERDE BLVD

SCALE: NTS
FILE: -



2 C-006 DETAIL AT McCULLOCH AVE SWANSON AVE

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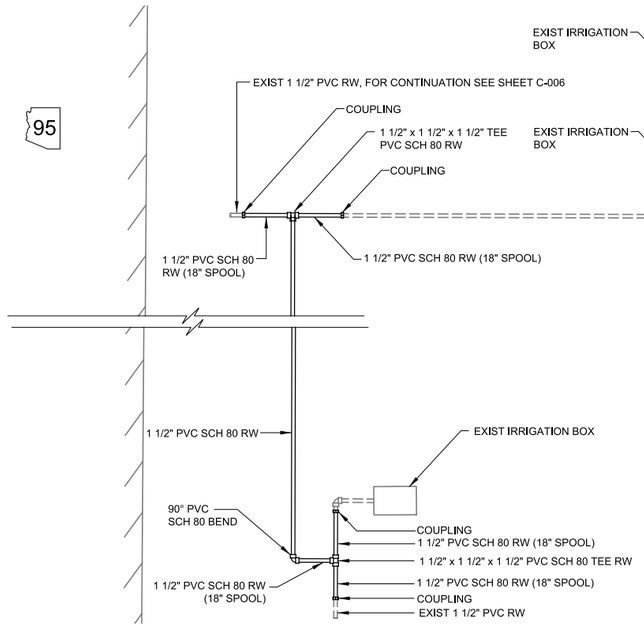

3 C-006 DETAIL AT SWANSON AVE

SCALE: NTS
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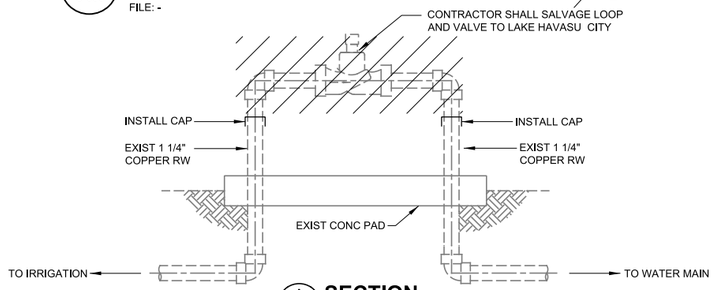
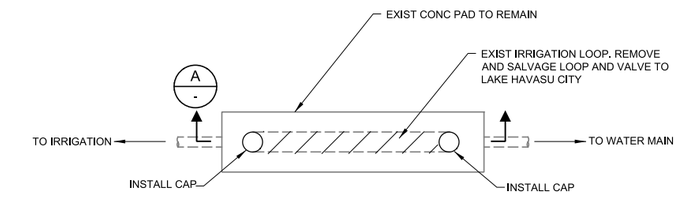


A - SECTION



PLAN

5 C-007 DETAIL AT SMOKETREE AVE

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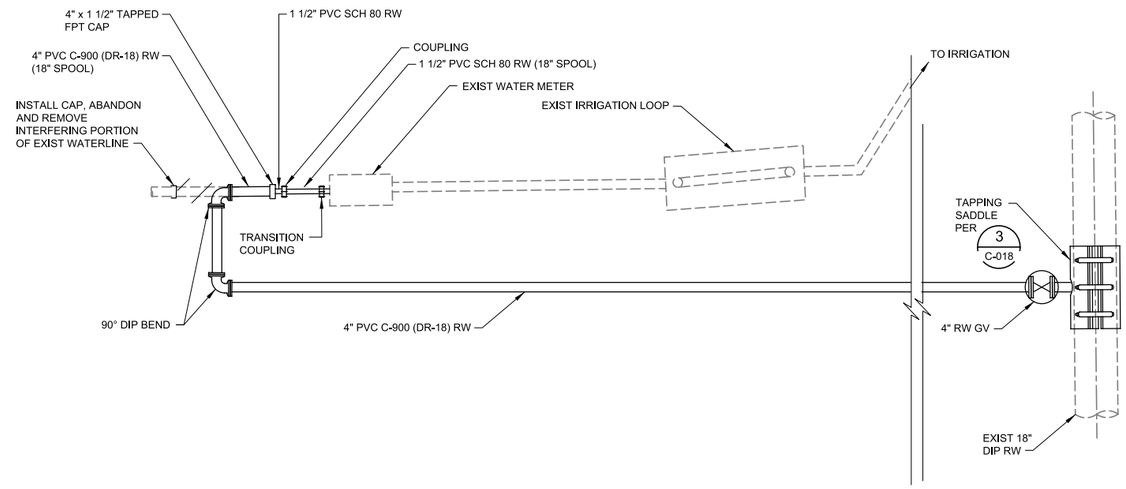

4 C-006 DETAIL AT SWANSON AVE

SCALE: NTS
FILE: -

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

CIVIL
DETAILS 2

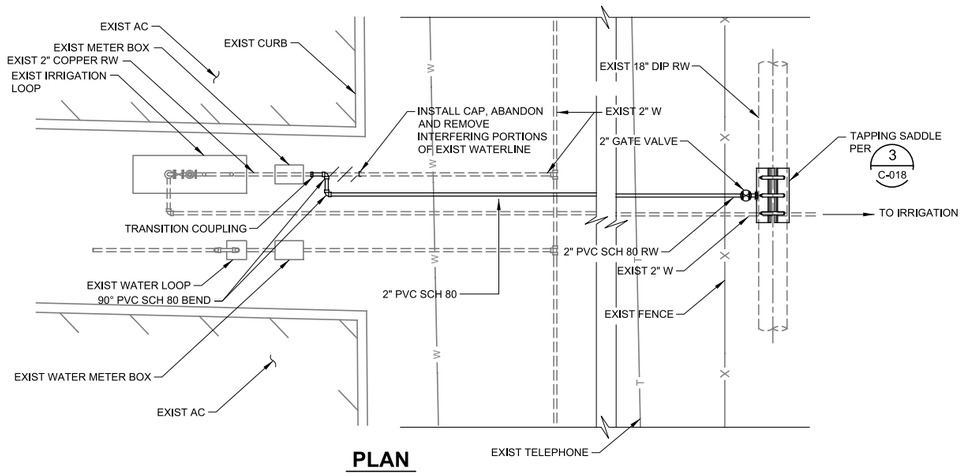
Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED 06/30/2016
ARIZONA, U.S.A.
EXPIRES 06-30-2018

BID SET

Sheet Number:
C-014
Sheet 20 OF 43

LAST SAVED BY: AArroyo

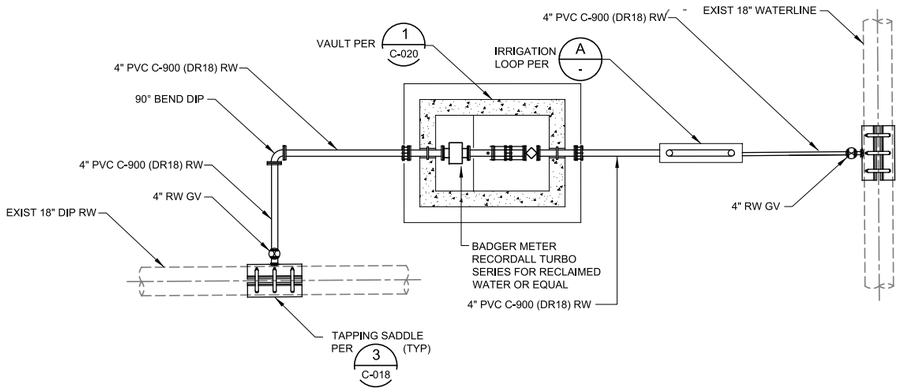
PROJECT NO. 9800A10 FILE NAME: P2-9800A10_C-014.dwg

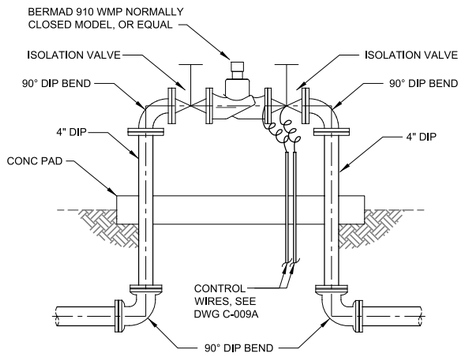


PLAN

1 / C-008 DETAIL AT LAKE HAVASU CITY AQUATIC CENTER

SCALE: NTS
FILE: -





A - SECTION

2 / C-009 DETAIL AT WALNUT DR

SCALE: NTS
FILE: -

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PROJECT NO. 9800A10 FILE NAME: P2-9800A10_C-015.dwg

LAKE HAVASU CITY

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COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

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Drawn by:	GD
Checked by:	JW
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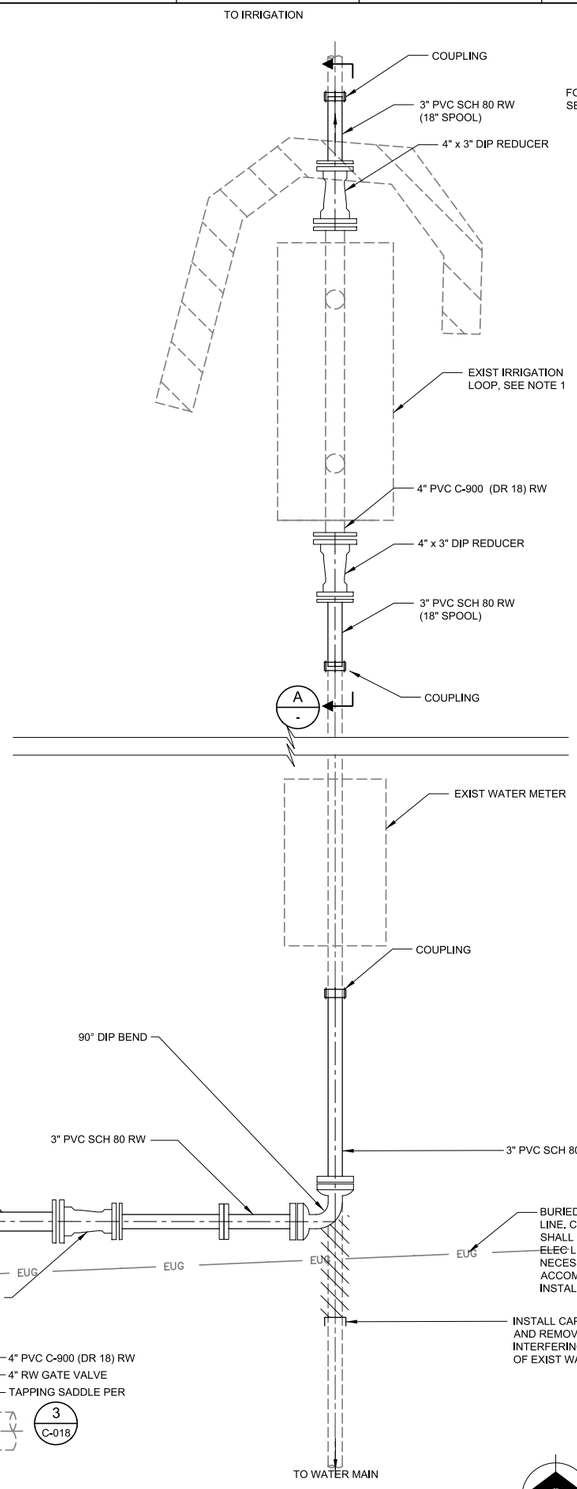
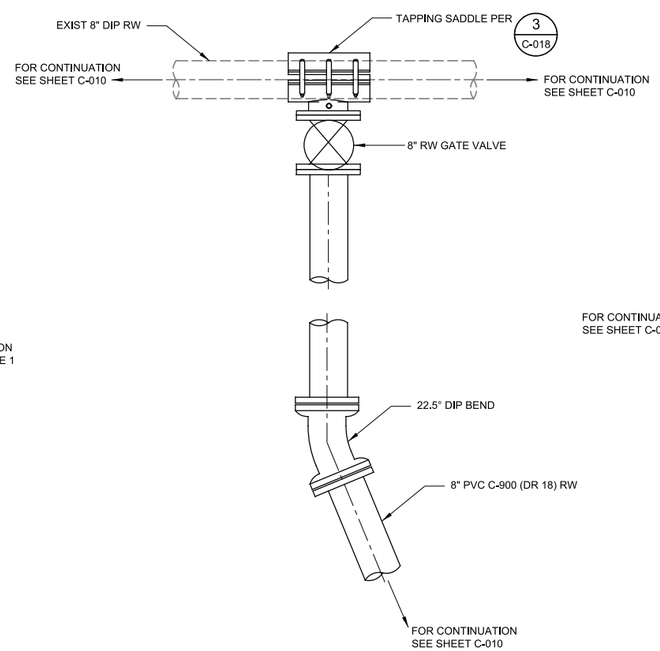
CIVIL
DETAILS 3

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED 08/31/2016
ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number:
C-015
Sheet 21 OF 43



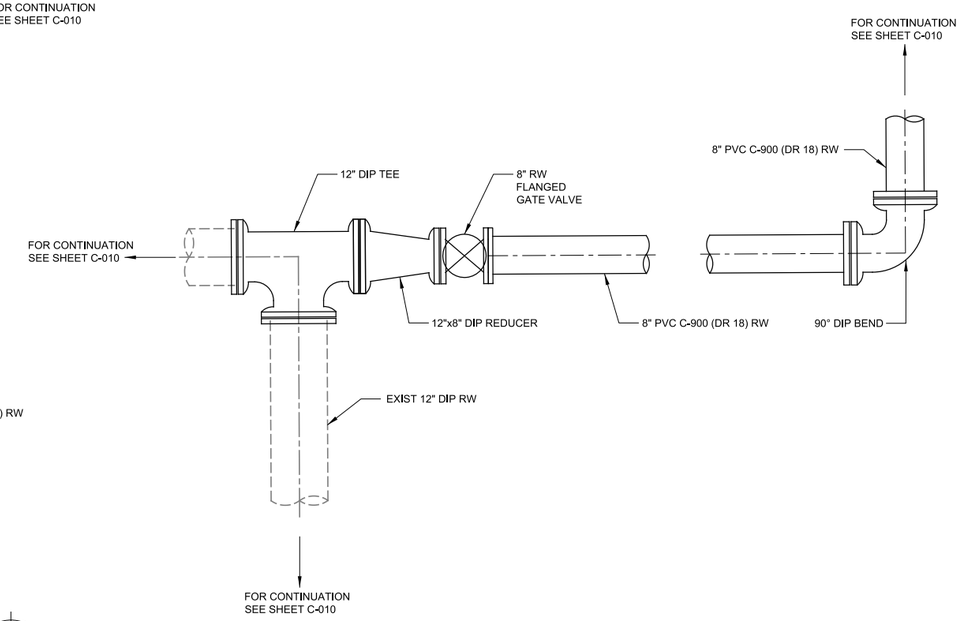
1 C-010 PLAN AT CYPRESS PARK
SCALE: NTS
FILE: -



2 C-010 DETAIL AT CYPRESS PARK
SCALE: NTS
FILE: -

NOTES:

1. REMOVE AND SALVAGE EXIST IRRIGATION LOOP TO LHC. CONTRACTOR SHALL INSTALL NEW 4' DIP IRRIGATION LOOP PER A -.



3 C-010 DETAIL AT CYPRESS PARK
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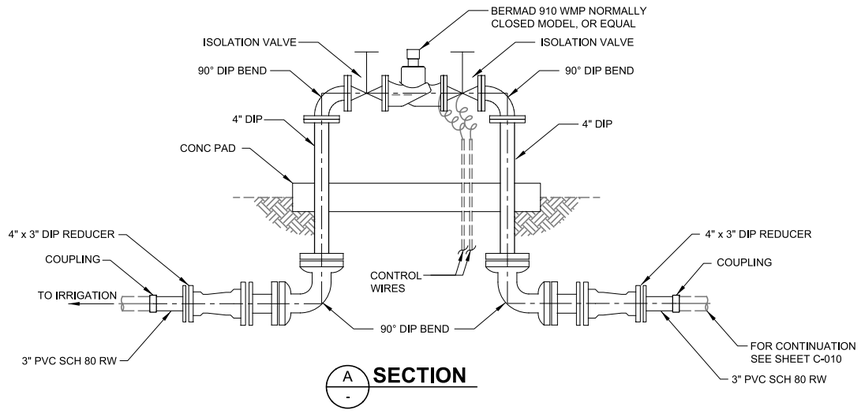

A - SECTION

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LAKE HAVASU CITY

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WATER CONSERVATION
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Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

CIVIL
DETAILS 4

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2018

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Sheet Number:
C-016
Sheet 22 OF 43

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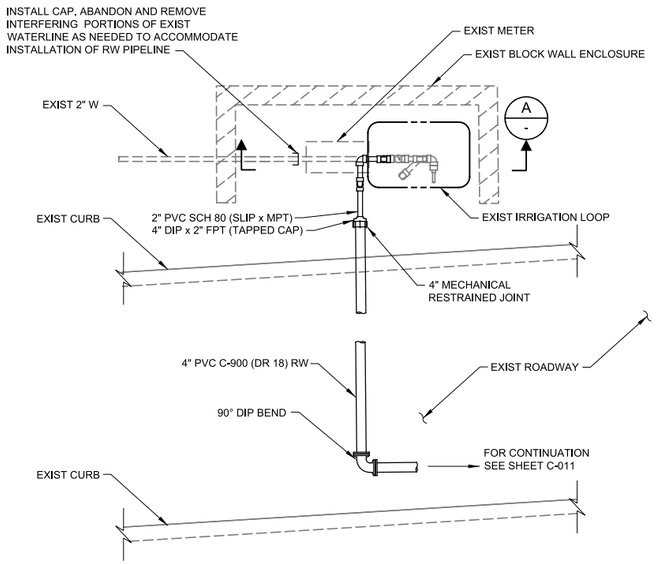
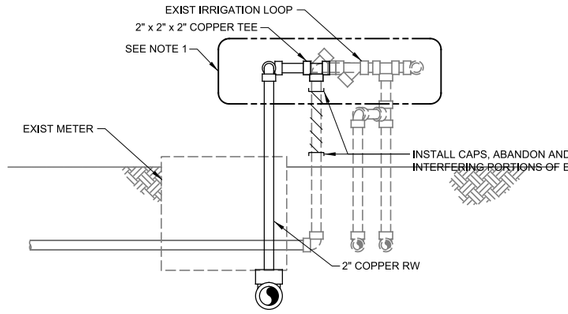
PROJECT NO. 9800A10 FILE NAME: P2-9800A10_C-016.dwg

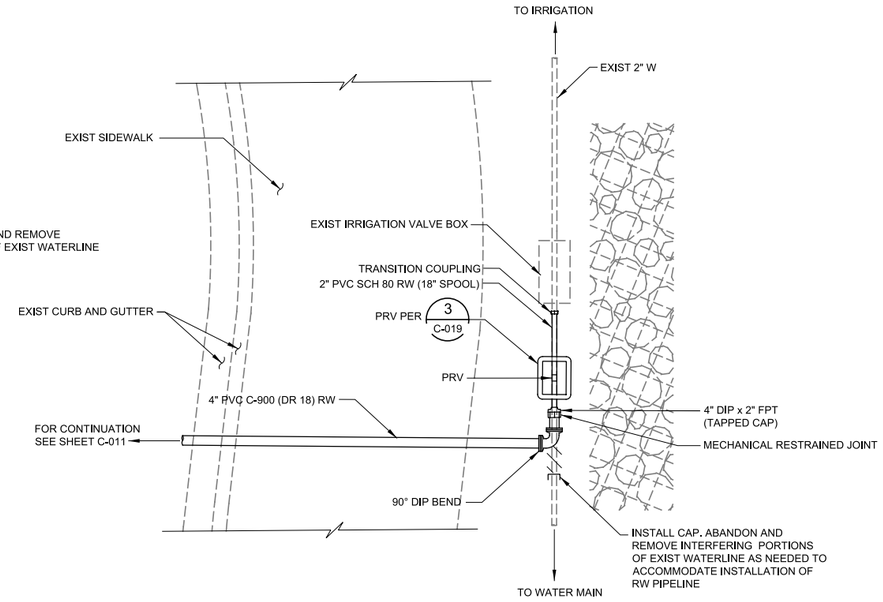


PLAN



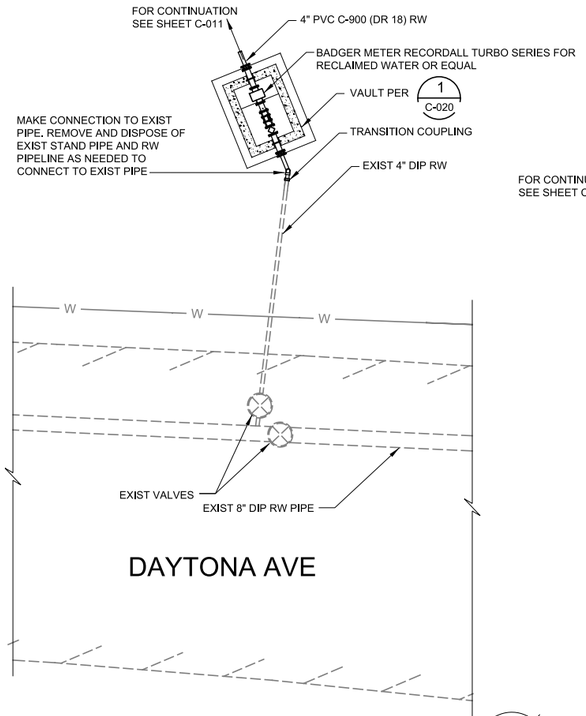
NOTES:
1. CONTRACTOR SHALL RAISE EXIST PIPE LOOP AS NECESSARY TO ACCOMMODATE RETROFIT.
2. THE 2' RW PIPE WILL BE IN PLACE AS SHOWN FOR RW SYSTEM. CONTRACTOR SHALL PROVIDE CAPS TO OWNER FOR FUTURE RW SPOOL REMOVAL.

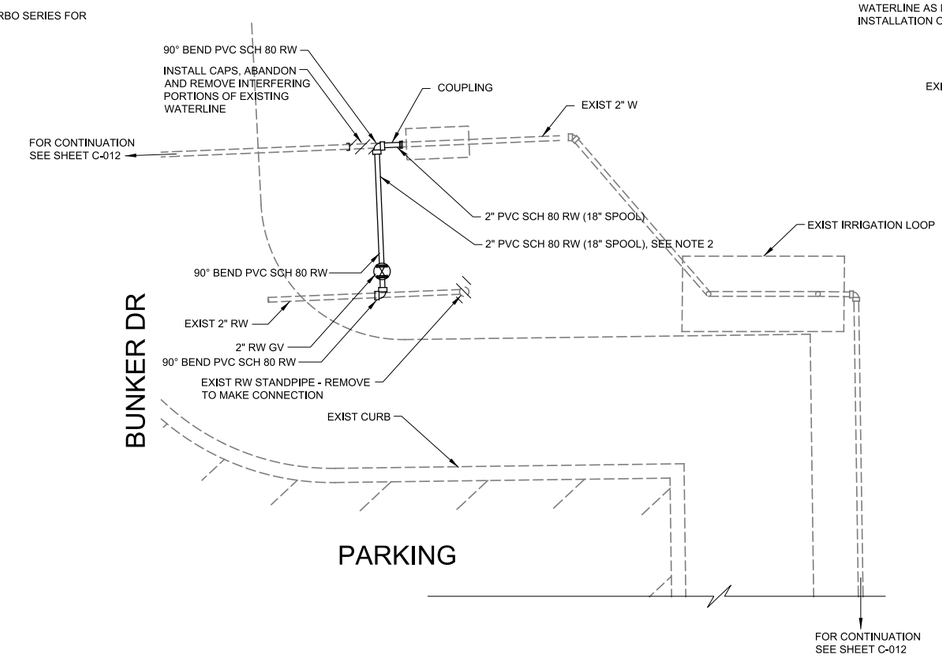
A - SECTION

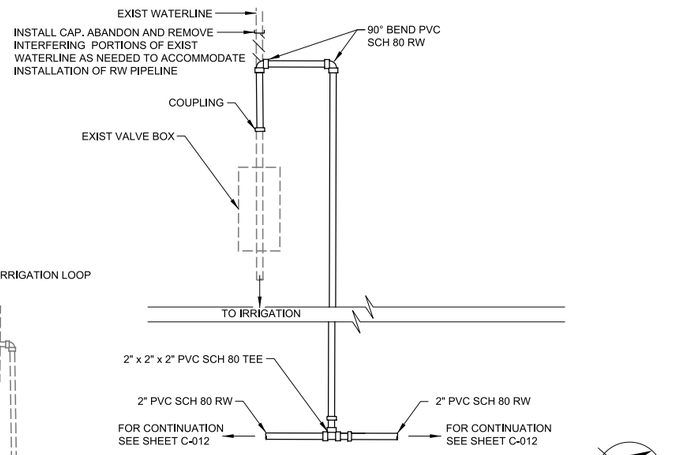


1 C-011 DETAIL AT ASU CAMPUS
SCALE: NTS
FILE: -

2 C-011 DETAIL AT ASU CAMPUS
SCALE: NTS
FILE: -







3 C-011 DETAIL AT ASU CAMPUS
SCALE: NTS
FILE: -

4 C-012 DETAIL AT JACK HARDIE PARK
SCALE: NTS
FILE: -

5 C-012 DETAIL AT JACK HARDIE PARK
SCALE: NTS
FILE: -

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

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COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

CIVIL
DETAILS 5

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2018

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Sheet Number:
C-017
Sheet 23 OF 43

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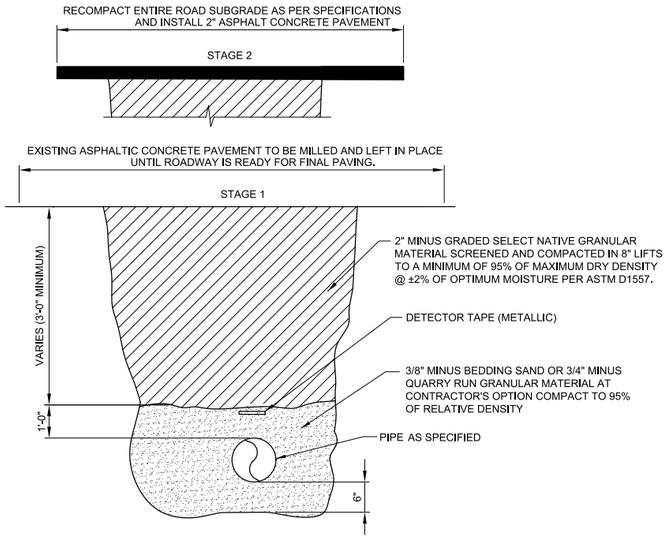
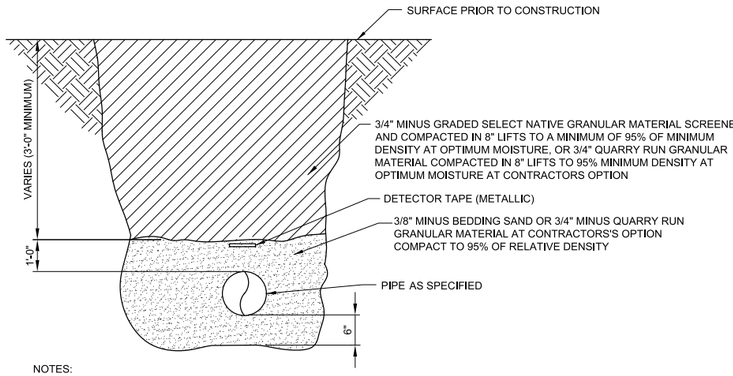
PROJECT NO. 9800A10 FILE NAME: P2-9800A10_C-017.dwg



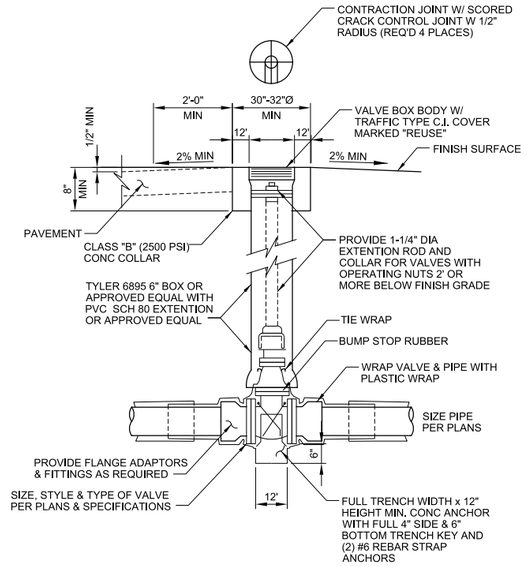
NOTES:
1. THIS DETAIL TO BE USED FOR ALL PIPE INSTALLATION WORK UNLESS OTHERWISE NOTED.
2. SEE SPEC LHC 02300 3.4B FOR MAX/MIN TRENCH REQUIREMENTS.

TYPICAL TRENCH FOR REUSE
INSTALLATIONS WHEN PAVEMENT IS REPLACED
NOT TO SCALE

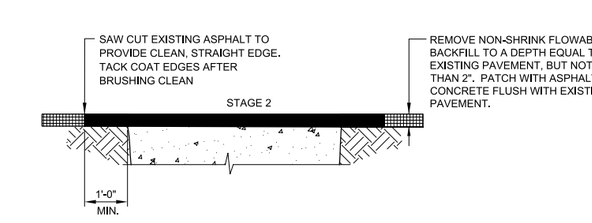


NOTES:
1. THIS DETAIL TO BE USED FOR ALL PIPE INSTALLATION WORK OUTSIDE ROADWAYS UNLESS OTHERWISE NOTED.
2. SEE SPEC LHC 02300 3.4B FOR MAX/MIN TRENCH REQUIREMENTS.

TYPICAL TRENCH FOR REUSE
NOT TO SCALE

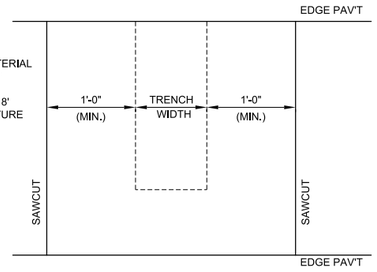


2 / - BURIED VALVE AND VALVE BOX
SCALE: NTS
FILE: -



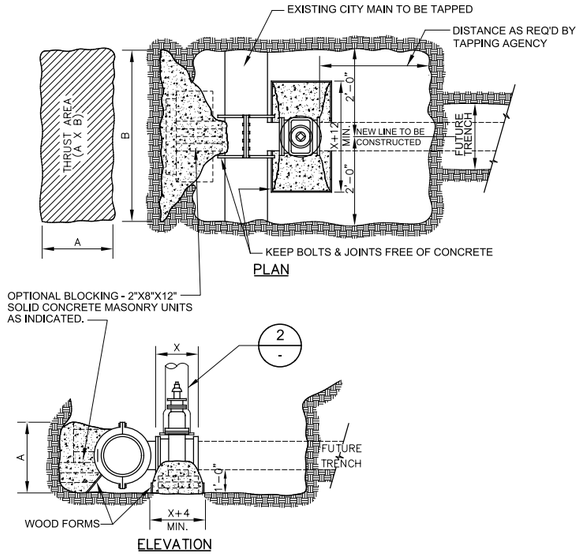
TYPICAL TRENCH USING NON-SHRINK FLOWABLE BACKFILL
NOT TO SCALE

NOTES:
1. USE NON-SHRINK (FLOWABLE) BACKFILL FLUSH WITH EXISTING ASPHALT UNTIL STAGE 2 PATCH.
2. APPROVED NON-SHRINK (FLOWABLE) BACKFILL MIX DESIGN IS AS FOLLOWS:
   200 LBS. COARSE AGGREGATE (3/8")
   3200 LBS. FINE AGGREGATE (SAND)
   233 LBS. CEMENT (TYPE V)
   40 GALLONS WATER
3. MAINTAIN VEHICLE TRAFFIC DURING CURE TIME WITH METAL PLATES.
4. THIS DETAIL SHALL APPLY ONLY TO ROADWAY AREAS NOT TO RECEIVE TOTAL PAVEMENT REPLACEMENT.
5. SEE SPEC LHC 02300 3.4B FOR MAX/MIN TENCH WIDTH REQUIREMENTS.



PAVEMENT REMOVAL & REPLACEMENT IN EXISTING STREET
NOT TO SCALE

1 / C-001 THRU C-012 TRENCH DETAILS
SCALE: NTS
FILE: -



NOTES
1. TAPPING SLEEVE TO BE PLACED A MINIMUM OF 18" FROM ANY BELL COUPLING, FITTING OR OTHER OBSTRUCTION.
2. CONTRACTOR SHALL SET TAPPING SLEEVE AND VALVE AND TIGHTEN ALL BOLTS PRIOR TO THE PRESSURE TEST.
3. ALL TAPPING SLEEVES AND VALVES MUST BE PRESSURE TESTED PRIOR TO BLOCKING OR TAPPING. THE TEST MUST BE WITNESSED AND APPROVED BY THE INSPECTOR.
4. BLOCKS ARE TO EXTEND TO UNDISTURBED GROUND AND BE INSTALLED BEFORE THE TAP IS MADE. ALL FLANGE BOLTS SHALL BE FREE AND CLEAR OF CONCRETE.
5. CONCRETE THRUST SHALL BE CLASS "B" PER SECT 725 OF MAG, NORMALLY, CURE TIME FOR CONCRETE IS 24 HOURS BEFORE BACKFILLING.
6. TAPS SHALL BE MADE BY APPROVED CONTRACTORS.
7. THIS DETAIL COVERS TAPPING SLEEVES 4" THROUGH 16" IN SIZE ON DUCTILE IRON, CAST IRON AND ASBESTOS CEMENT PIPE. ANY OTHER SIZE OR TYPE OF PIPE WILL REQUIRE A SEPARATE SUBMITTAL AND APPROVAL BY THE ENGINEER.

SIZE OF PIPE BEING CONNECTED	MINIMUM THRUST AREA REQUIRED EQUALS (AXB) (SQUARE FEET)
4" & LESS	3
6"	4
8"	6
10"	9
12"	13
16"	23

3 / C-013 THRU C-016 TAPPING SLEEVE AND VALVE
SCALE: NTS
FILE: -

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: GG
Drawn by: GD
Checked by: JW
Date: AUGUST 2016
Dwg scale:

CIVIL
DETAILS 6

Registered Professional Engineer (Civil) CERTIFICATE NO. 44630 GREG A. GOULD DATE SIGNED 08/31/18 ARIZONA, U.S.A.
EXPIRES 06-30-2018

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Sheet Number: C-018
Sheet 24 OF 43

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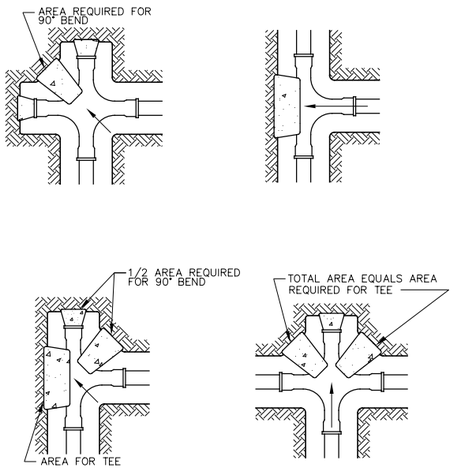
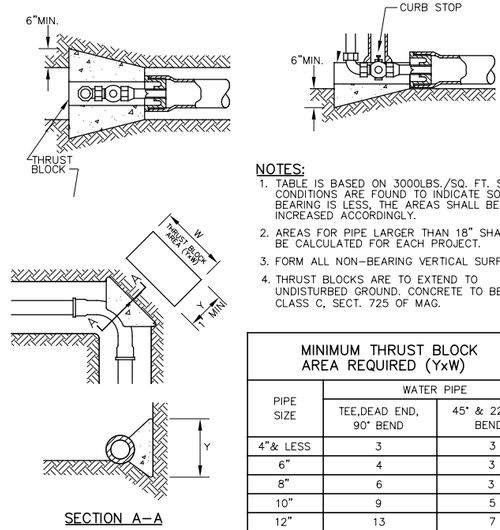
FILE NAME: P2-9800A10_C-018.dwg

TYPICAL LOCATION OF THRUST BLOCKS



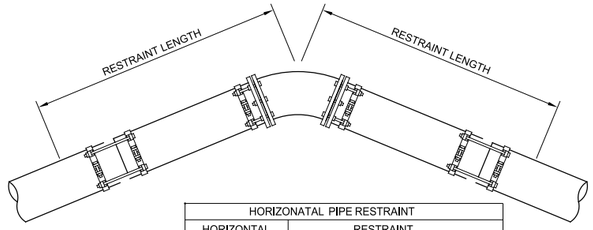


SECTION A–A

NOTES:

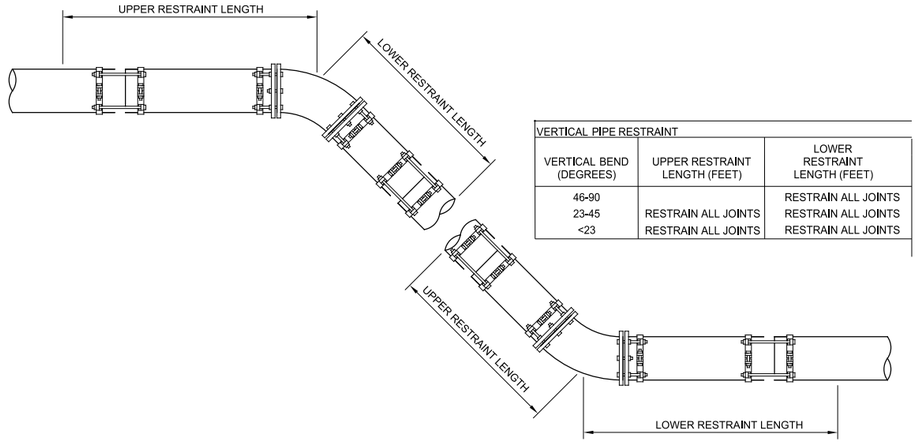
1. TABLE IS BASED ON 3000LBS./SQ. FT. SOIL. IF CONDITIONS ARE FOUND TO INDICATE SOIL BEARING IS LESS, THE AREAS SHALL BE INCREASED ACCORDINGLY.
2. AREAS FOR PIPE LARGER THAN 18" SHALL BE CALCULATED FOR EACH PROJECT.
3. FORM ALL NON–BEARING VERTICAL SURFACES.
4. THRUST BLOCKS ARE TO EXTEND TO UNDISTURBED GROUND. CONCRETE TO BE CLASS C, SECT. 725 OF MAG.

MINIMUM THRUST BLOCK AREA REQUIRED (YxW)		
PIPE SIZE	WATER PIPE	
	TEE,DEAD END, 90° BEND	45° & 22 1/2° BENDS
4"& LESS	3	3
6"	4	3
8"	6	3
10"	9	5
12"	13	7
16"	23	12



HORIZONATAL PIPE RESTRAINT	
HORIZONTAL BEND (DEGREES)	RESTRAINT LENGTH (FEET)
46-90	RESTRAIN ALL JOINTS
23-45	RESTRAIN ALL JOINTS
<23	RESTRAIN ALL JOINTS

HORIZONTAL PIPE RESTRAINT LENGTH



VERTICAL PIPE RESTRAINT		
VERTICAL BEND (DEGREES)	UPPER RESTRAINT LENGTH (FEET)	LOWER RESTRAINT LENGTH (FEET)
46-90		RESTRAIN ALL JOINTS
23-45	RESTRAIN ALL JOINTS	RESTRAIN ALL JOINTS
<23	RESTRAIN ALL JOINTS	RESTRAIN ALL JOINTS

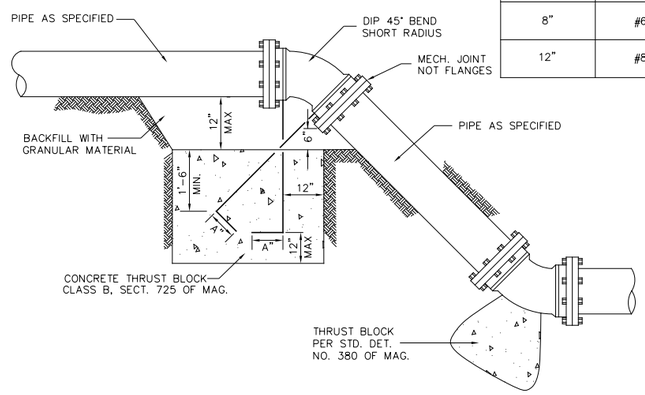
VERTICAL PIPE RESTRAINT LENGTH

NOTES

BARS TO CONCRETE THRUST BLOCKS TO BE COATED WITH 2 COATS COAL TAR, EPOXY OR BY OTHERS APPROVED METHOD. BARS TO HAVE 90° HOOK ON LOWER END, AS PER TABLE.

PIPE SIZE	MIN. BAR SIZE	"A"–DIMENSION (HOOK)	MIN. * BLOCK DIM.
6"	#6	6"	3'x3'x3'
8"	#6	9"	4'x4'x2.5'
12"	#8	9"	4'x5'x5'

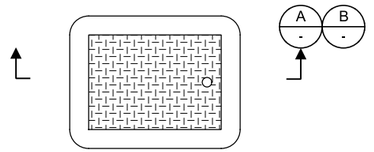
*FOR 125 PSI WORKING PRESURE



NOTES

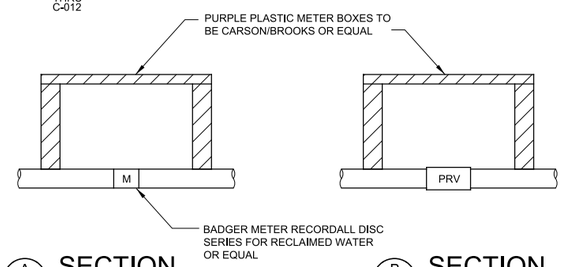
1. EITHER THIS DETAIL OR RESTRAINT RODS CAN BE USED WHEN IT IS ALLOWED TO RELOCATE A WATER LINE UPWARD OR DOWNWARD TO CROSS A CONFLICT.
2. BARS TO CONCRETE THRUST BLOCK TO BE COATED WITH 2 COATS COAL TAR, EPOXY OR BY OTHER APPROVED METHOD. BARS TO HAVE 90° HOOK ON LOWER, AS PER TABLE.

1 / C-001 THRU C-012 — **PIPE THRUST BLOCK**
SCALE: NTS
FILE: -



TOP

2 / C-001 THRU C-012 — **JOINT RESTRAINTS**
SCALE: NTS
FILE: FILE



A / - — **SECTION**

B / - — **SECTION**

3 / C-013 THRU C-014 — **FLOW METER BOX**
SCALE: NTS
FILE: FILE

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LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

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WATER CONSERVATION
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Designed by:	GG
Drown by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

CIVIL
DETAILS 7

Registered Professional Engineer (Civil) CERTIFICATE NO. 44630 GREG A. GOULD DATE SIGNED 08/31/2016 ARIZONA, U.S.A.
EXPIRES 06-30-2018

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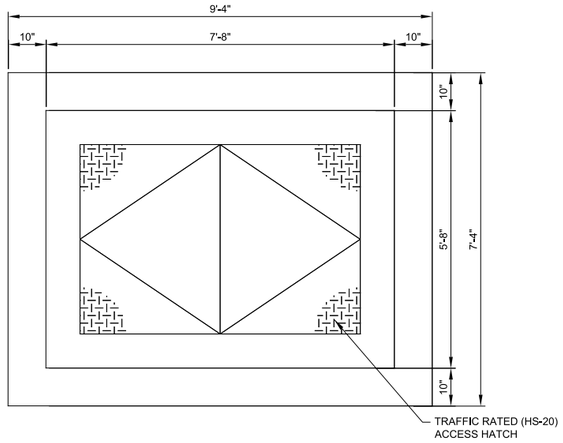
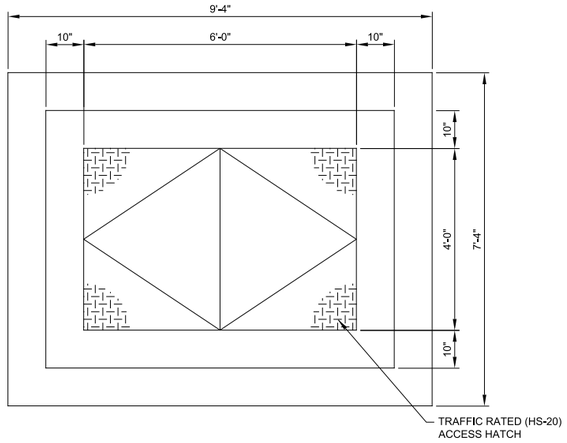
Sheet Number:
C-019
Sheet 25 OF 43

LAST SAVED BY: gdavis

PROJECT NO. 9800A10 FILE NAME: P2-9800A10_C-019.dwg



TOP PLAN



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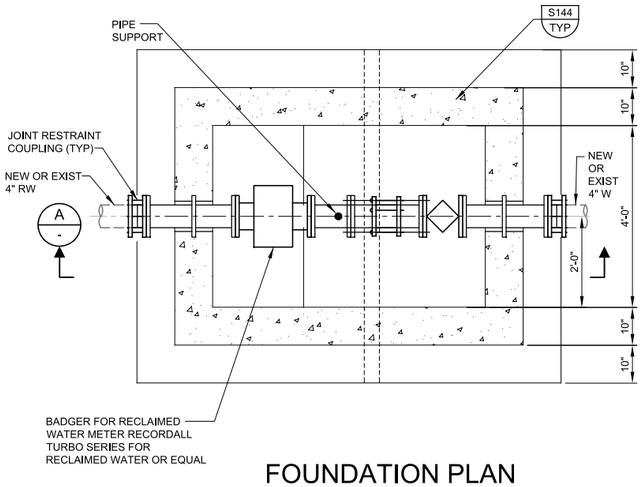
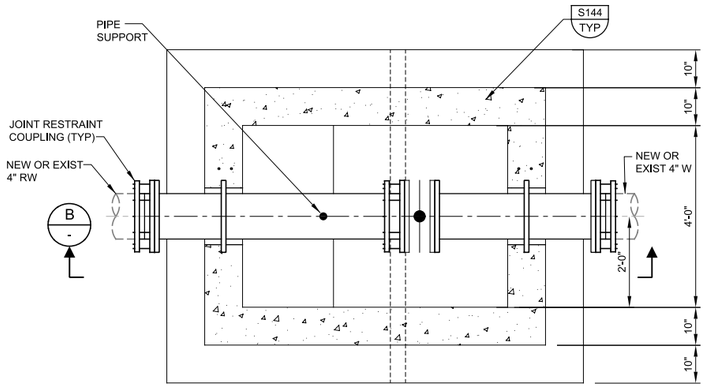
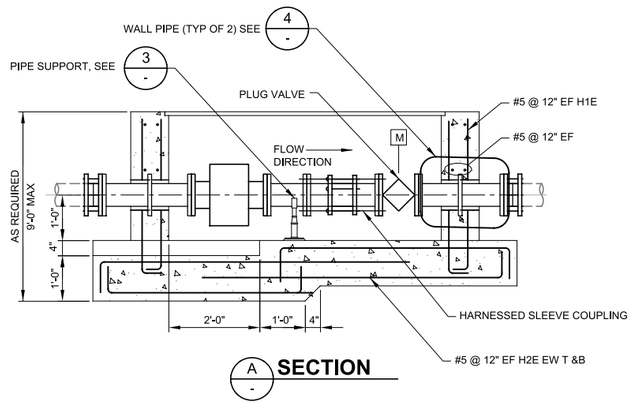


FOUNDATION PLAN



FOUNDATION PLAN

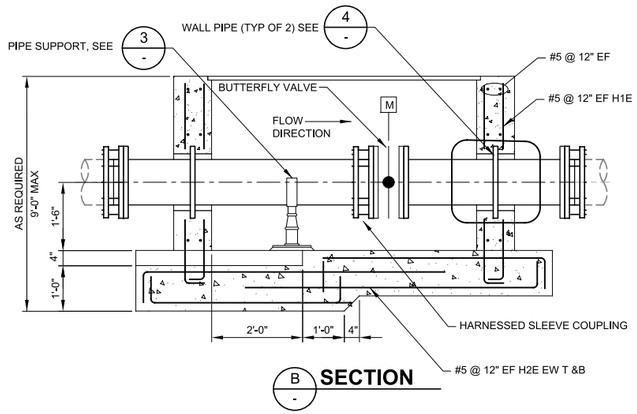


A **SECTION**
-

1 FLOW METER VAULT DETAILS

1 / C-009 — SCALE: NTS — FILE: -

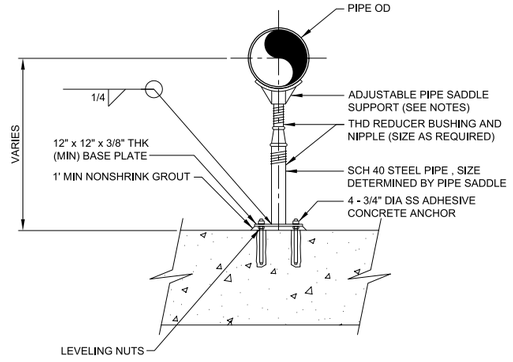
C-013
C-015
C-017



B **SECTION**
-

2 VALVE VAULT DETAILS

2 / C-010 — SCALE: NTS — FILE: -



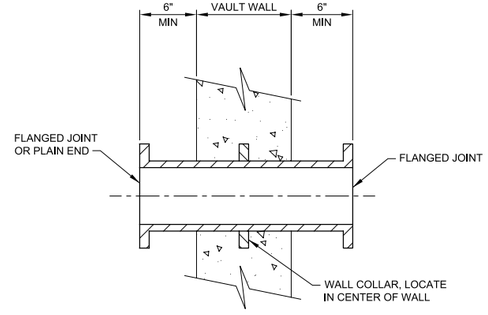
NOTES;

1. WHERE PIPE SUPPORT IS INDICATED TO BE LOCATED UNDER VALVE, PROVIDE ADJUSTABLE PLATE SUPPORT IN LIEU OF SADDLE SUPPORT.
2. COAT PIPE SYSTEM AS SPECIFIED.

3 PIPE SUPPORT SADDLE

3 / - — SCALE: NTS — FILE: -

C-020A



4 VAULT WALL PENETRATION

4 / - — SCALE: NTS — FILE: -

C-017
C-020A

LAST SAVED BY: gdavis

PROJECT NO. 9800A10 FILE NAME: P2-9800A10_C-020.dwg

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

CIVIL
DETAILS 8

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A.
GOULD
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2018

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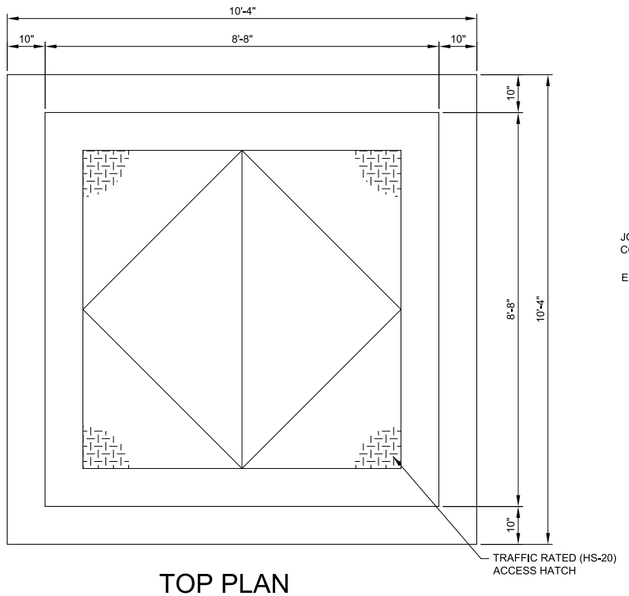
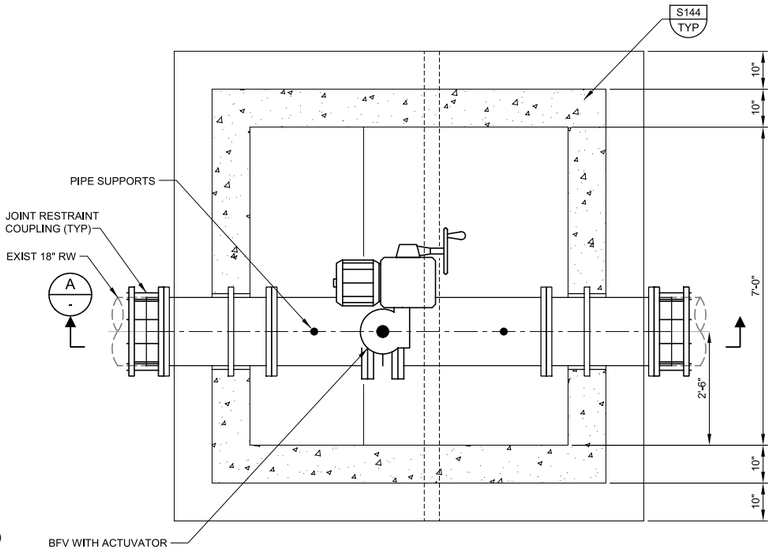
Sheet Number:
C-020
Sheet 26 OF 43



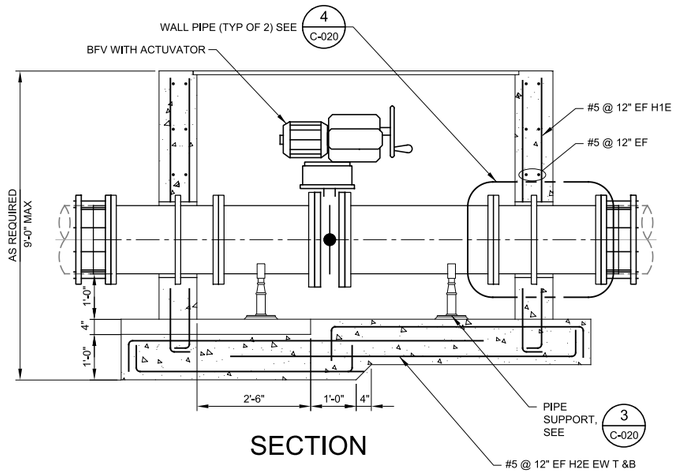
TOP PLAN



FOUNDATION PLAN

GENERAL NOTES:

1. VAULT DETALS ARE NOT TO SCALE (NTS).



SECTION

1 C-007 VALVE METER VAULT DETAILS

SCALE: NTS
FILE: -

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

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COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

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Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

CIVIL
DETAILS 8A

Registered Professional Engineer (Civil)
CERTIFICATE NO.
57417
KELI A.
CALLAHAN
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2017

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Sheet Number:
C-020A
Sheet 27 OF 43

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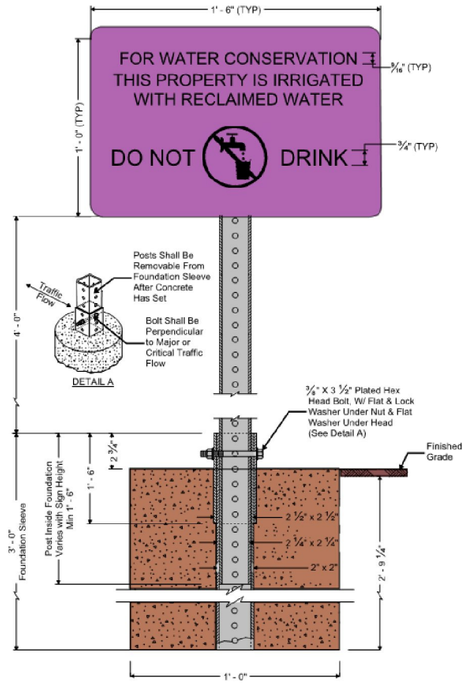
PROJECT NO. 9800A10 FILE NAME: P2-9800A10_C-020A.dwg

ENLARGED PLAN



1 RECLAIMED WATER SIGN DETAIL

NOTES:

1. CONTRACTOR SHALL SUBMIT SIGN DETAIL FOR APPROVAL AND SHALL COORDINATE SIGN LOCATIONS WITH OWNER.
2. COLOR: COPY: WHITE
   BACKGROUND: PURPLE (PANTONE 512)
   SIGN PANEL: 1/8" ALUMINUM ALLOY 5052-H38 PER ASTM B 209
   PROVIDE 3/8" BORDER BETWEEN PANEL AND BACKGROUND

CYPRESS BALL FIELDS
RECLAIMED WATER SIGNAGE LOCATIONS

1 / - SIGNAGE
SCALE: NTS
FILE: SITE 8

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COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

CIVIL
SIGNAGE 1

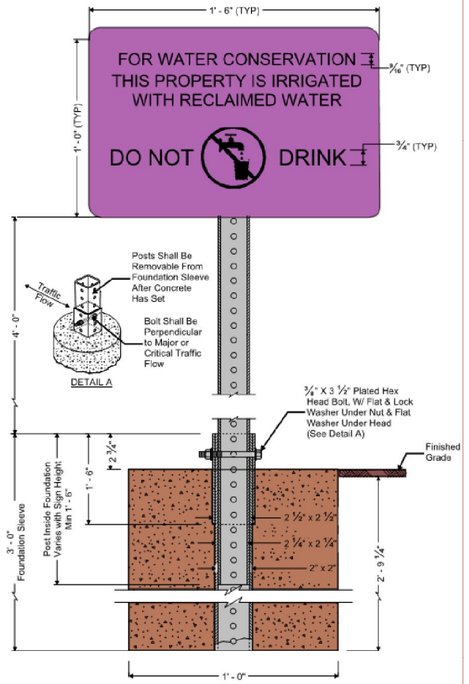
Registered Professional Engineer
CERTIFICATE NO.
57417
KELI A. CALLAHAN
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2017

Sheet Number:
C-021
Sheet 28 OF 43

LAST SAVED BY: gdavis

PROJECT NO. 9800A10 FILE NAME: P2-9800A10_C-021.dwg

ENLARGED PLAN



1 RECLAIMED WATER SIGN DETAIL

NOTES:

1. CONTRACTOR SHALL SUBMIT SIGN DETAIL FOR APPROVAL AND SHALL COORDINATE SIGN LOCATIONS WITH OWNER.
2. COLOR: COPY: WHITE
   BACKGROUND: PURPLE (PANTONE 512)
   SIGN PANEL: 1/8" ALUMINUM ALLOY 5052-H38 PER ASTM B 209
   PROVIDE 3/8" BORDER BETWEEN PANEL AND BACKGROUND

ASU CAMPUS
RECLAIMED WATER SIGNAGE LOCATIONS

1 / - SIGNAGE
SCALE: NTS
FILE: SITE 8

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WATER CONSERVATION
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PACKAGE NO. 2

Designed by:	GG
Drawn by:	GD
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

CIVIL
SIGNAGE 2

Registered Professional Engineer (Civil) CERTIFICATE NO. 57417 KELI A. CALLAHAN DATE SIGNED 08/31/2016 ARIZONA, U.S.A.
EXPIRES 06-30-2017

Sheet Number:
C-022
Sheet 29 OF 43

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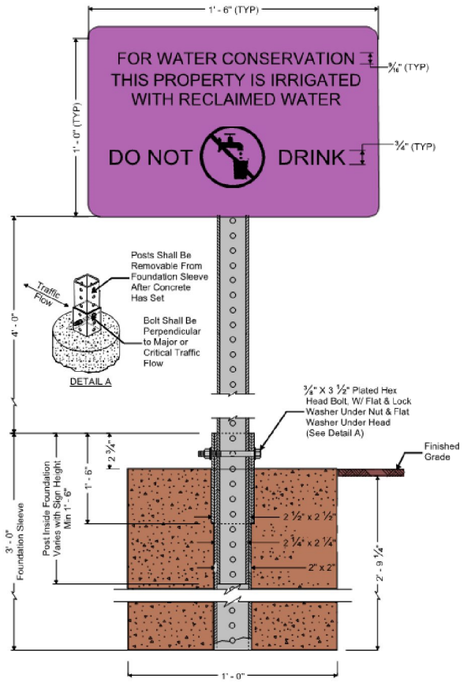
PROJECT NO. 9800A10
FILE NAME: P2-9800A10_C-022.dwg

ENLARGED PLAN



1 RECLAIMED WATER SIGN DETAIL

NOTES:

1. CONTRACTOR SHALL SUBMIT SIGN DETAIL FOR APPROVAL AND SHALL COORDINATE SIGN LOCATIONS WITH OWNER.
2. COLOR: COPY: WHITE
   BACKGROUND: PURPLE (PANTONE 512)
   SIGN PANEL: 1/8" ALUMINUM ALLOY 5052-H38 PER ASTM B 209
   PROVIDE 3/8" BORDER BETWEEN PANEL AND BACKGROUND

JACK HARDIE PARK
RECLAIMED WATER SIGNAGE LOCATIONS

1 / - SIGNAGE
SCALE: NTS
FILE: SITE 8

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Drawn by:	GD
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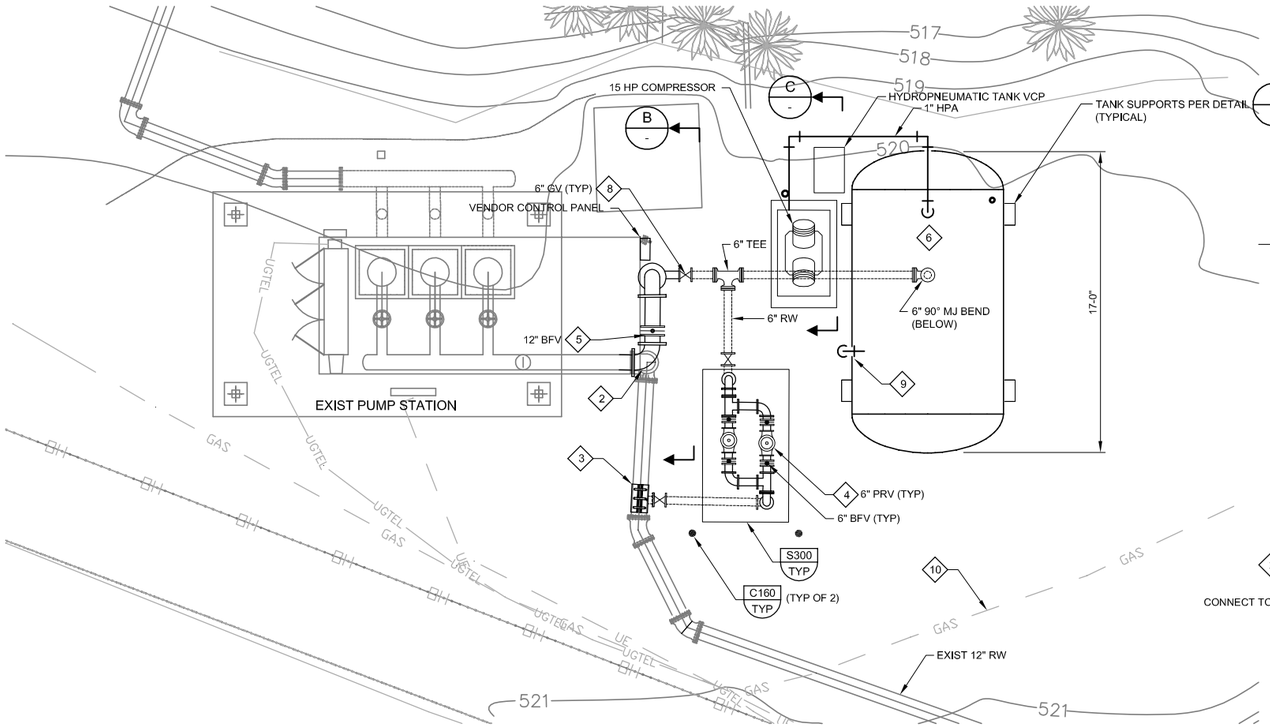
Date:	AUGUST 2016
Dwg scale:	

CIVIL
SIGNAGE 3

Registered Professional Engineer (Civil)
CERTIFICATE NO.
57417
KELI A. CALLAHAN
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2017

Sheet Number:
C-023
Sheet 30 OF 43

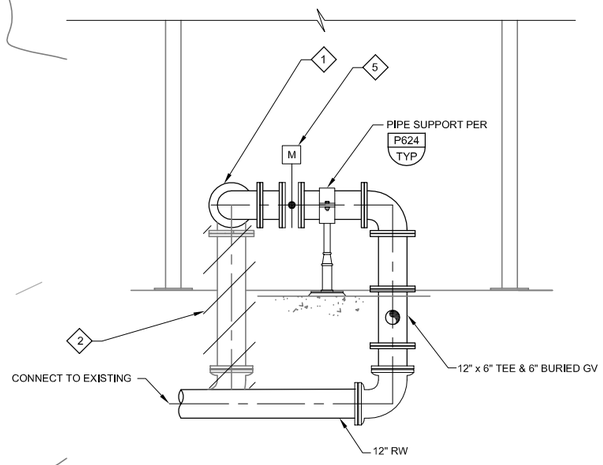
LAST SAVED BY: gdavis
PROJECT NO. 9800A10
FILE NAME: P2-9800A10_C-023.dwg



A PUMP STATION PLAN

FILE: -

0 5' 10'



B SECTION

SCALE: 3/8" = 1'-0"
FILE: FILE

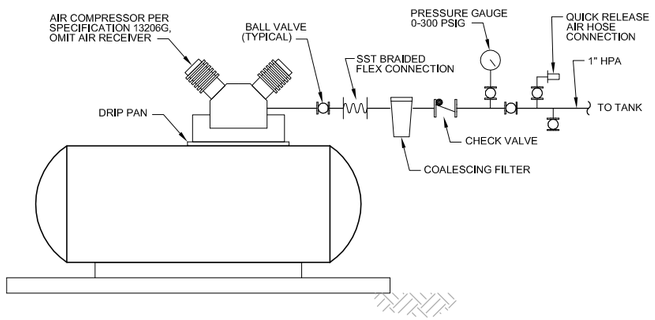
0 1' 2' 3' 6'

GENERAL NOTES:

1. PROVIDE POWER FOR COMPRESSOR (15 HORSEPOWER) AND ELECTRIC ACTUATOR (1 HORSEPOWER).
2. WHEN CONNECTING STAINLESS STEEL TO BRASS OR COPPER, USE DIELECTRIC FITTINGS OR ISOLATION GASKETS.

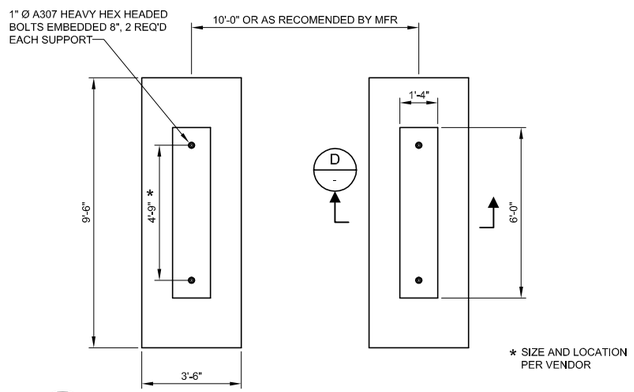
KEY NOTES:

1. ROTATE 12" 90° BEND
2. REMOVE CONFLICTING PORTION OF 12" PIPE AND RE-ROUTE PIPING AS SHOWN.
3. INSTALL 12" x 6" TAPPING SLEEVE PER 3 / C-018
4. PROCURE PRESSURE REDUCING VALVES WITH ANTI-CAVITATION TRIM PER SECTION 15118.
5. INSTALL BUTTERFLY VALVE PER SECTION 02551 WITH ELECTRIC ACTUATOR PER SECTION 13447.
6. PROCURE 10,000 GAL HYDROPNEUMATIC TANK, COMPRESSOR, AND APPURTENANCES PER SECTION 13206G.
7. FOOTINGS SHALL NOT BEAR ON A COMBINATION OF CEMENTED SOILS (CALICHE) AND NON CEMENTED SOILS. BEAR ON DENSE NATIVE SOIL OR COMPACTED STRUCTURAL SOIL.
8. BURIED VALVE AND VALVE BOX PER 2 / C-018
9. SIGHT GAUGE PER 2 / -
10. NATURAL GAS LINE, STAY 2-FEET CLEAR, CONTRACTOR TO LOCATE PRIOR TO ANY EXCAVATION



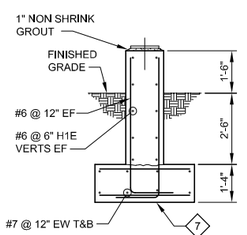
C SECTION

SCALE: NTS
FILE: -



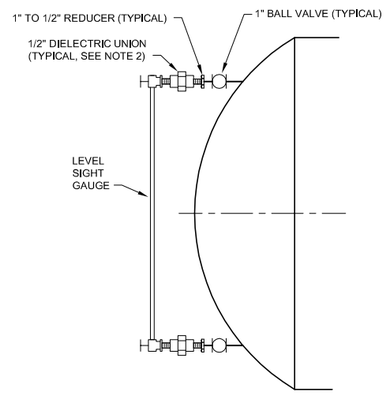
1 HYDROPNEUMATIC TANK SUPPORTS DETAIL

SCALE: 1/4"=1'-0"



D SECTION

SCALE: 3/8" = 1'-0"



2 DETAIL

SCALE: NTS
FILE: -

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM 1	2/10/15

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT

WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	JW
Drawn by:	MC
Checked by:	JW
Date:	AUGUST 2016
Dwg scale:	

MECHANICAL
MULBERRY WWTP
HYDROPNEUMATIC
TANK AND PIPING
MODIFICATIONS

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED 06/30/2016
ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number:
M-001
Sheet 31 OF 43

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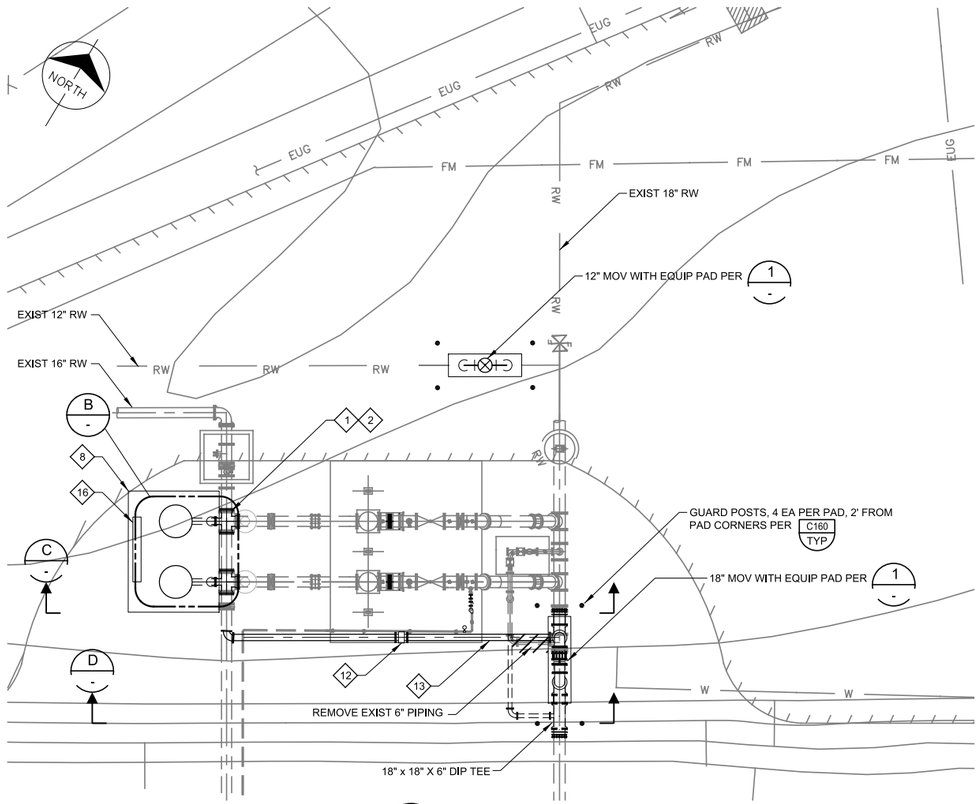
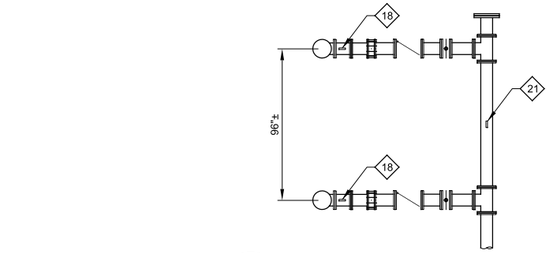


A BOTTOM PLAN

SCALE: 1" = 10'
FILE: -

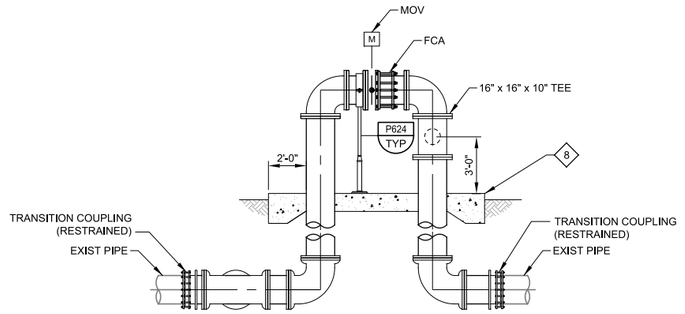
0 5' 10' 20'



B DISCHARGE HEADER PLAN

SCALE: 1/4" = 1'-0"
FILE: -

0 2' 4' 8'



NOTES:
1. CONTRACTOR TO COORDINATE LOCATION OF PADS WITH THE OWNER.
2. ALL JOINTS TO BE MECHANICALLY RESTRAINED.
3. PADS TO BE 3'-0" WIDE, LENGTH VARIES.
4. CONTRACTOR TO FIELD VERIFY EXISTING PIPE MATERIAL AND DIAMETER.
5. PROVIDE BUTTERFLY VALVES PER SECTION 02551 WITH ELECTRICAL ACTUATORS PER SECTION 13447.

1/- DETAIL

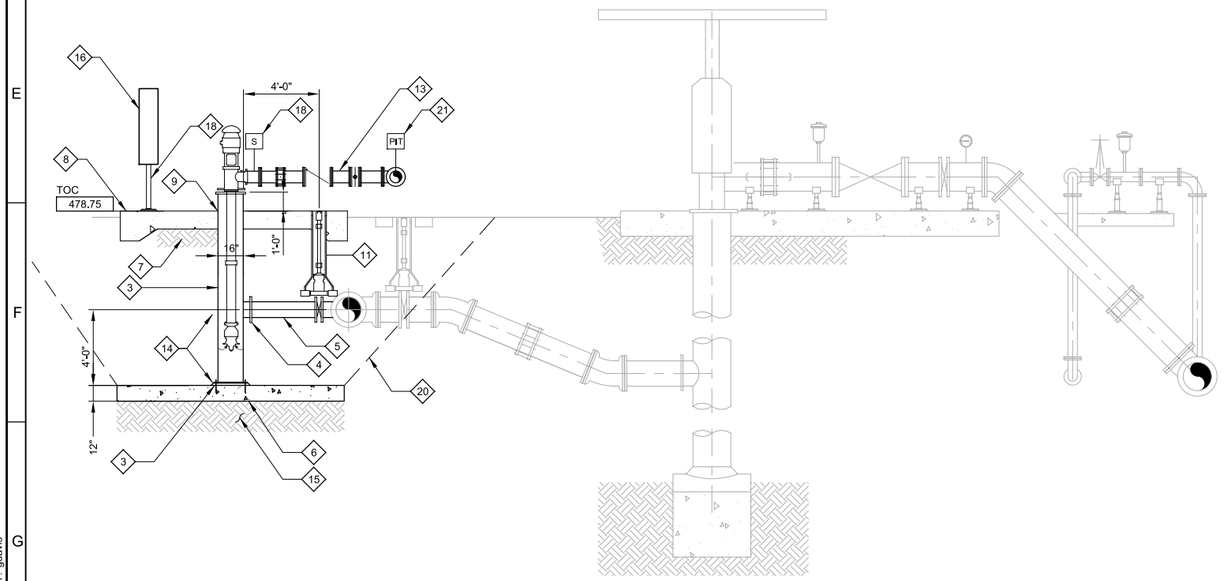
SCALE: NTS
FILE: -

GENERAL NOTES

1. ALL JOINTS SHALL BE RESTRAINED.
2. REFER TO SECTION 11211
3. CONTRACTOR TO VERIFY ALL ELEVATIONS.

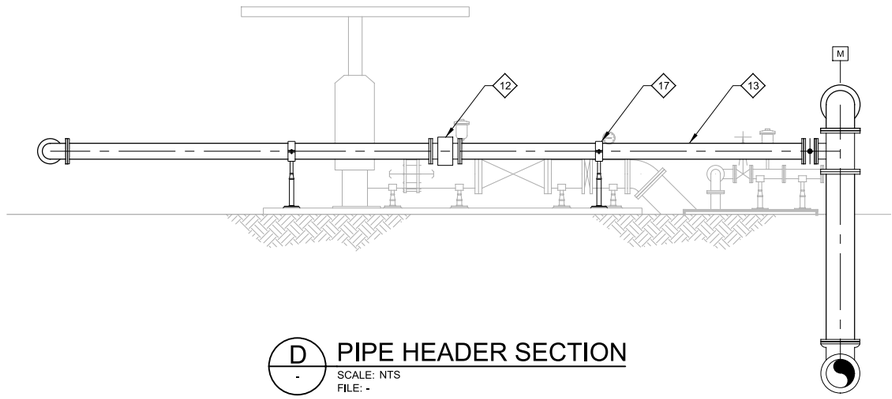
KEY NOTES

1. EXCAVATE EXIST 16" x 16" x 16" TEE (2 PLACES)
2. INSTALL 16" x 16" x 16" x 10" DIP CROSS
3. 16" VTP STEEL CAN, PROVIDED BY PACKAGE PUMP SUPPLIER, BOLTED AND PLUMB TO EQUIPMENT PAD
4. ISOLATION FLANGE, DIP STEEL
5. 10" DIP FLG x FLG
6. EQUIPMENT BASE, 12' x 16' x 12" THICK PER S302 TYP
7. COMPACT SUB BASE TO 95% MAXIMUM DENSITY
8. EQUIPMENT SLAB PER S300 TYP, 6x12x12 THICK
9. SLEEVE PENETRATION PER P302 TYP
10. 10" GATE VALVE, NON RISING STEM
11. VALVE BOX PER P022 TYP (SIM)
12. MAGNETIC FLOW METER, SUPPLIED BY PACKAGE PUMP SUPPLIER
13. DISCHARGE HEADER 8" DIP, OR STEEL SUPPLIED BY PACKAGE PUMP SUPPLER
14. USE NON-SHRINK GROUT AS NECESSARY TO LEVEL AND PLUMB CAN. 1 1/2" MAXIMUM THICKNESS
15. COMPACT NATIVE SOIL TO 95%
16. PACKAGE PUMP SUPPLIER VENDER CONTROL PANEL
17. PIPE SUPPORT PER P624 TYP WHERE NO CONRETE PAD EXIST, USE S302 TYP, 2x2x12" THICK
18. HIGH PRESSURE SWITCH
19. PROPOSED EXCAVATION
20. BACK FILL WITH CLSM TO SPRING LINE OF 10" SUCTION PIPE
21. PRESSURE TRANSDUCER



C SECTION

SCALE: NTS
FILE: -



D PIPE HEADER SECTION

SCALE: NTS
FILE: -

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM NO. 1	1/19/2016

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	JW
Drawn by:	GD
Checked by:	
Date:	AUGUST 2016
Dwg scale:	AS SHOWN

MECHANICAL
ISLAND EFFLUENT REUSE PUMP STATION

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED 08/31/2016
ARIZONA, U.S.A.
EXPIRES 06-30-2018

carollo

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Sheet Number:
M-002
Sheet 32 OF 43

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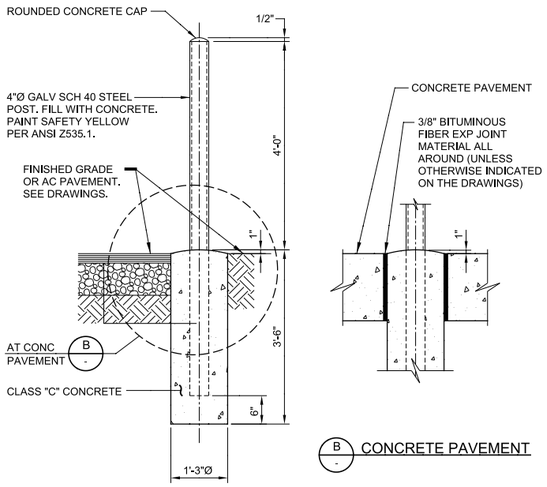


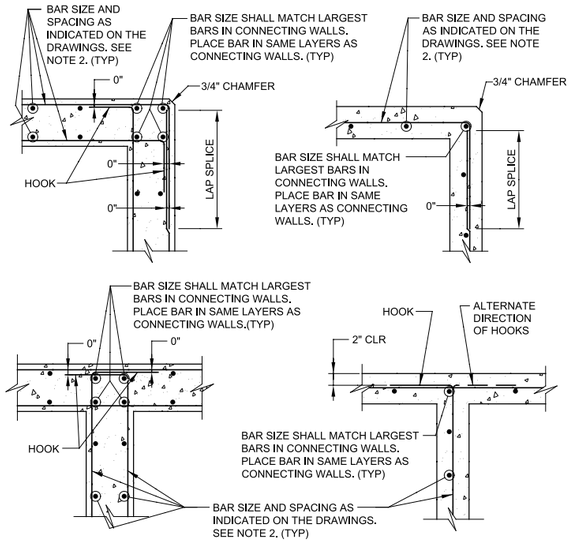
A - AC PAVEMENT OR FINISHED GRADE

B - CONCRETE PAVEMENT

C160 GUARD POST

TYP N

01/13/14

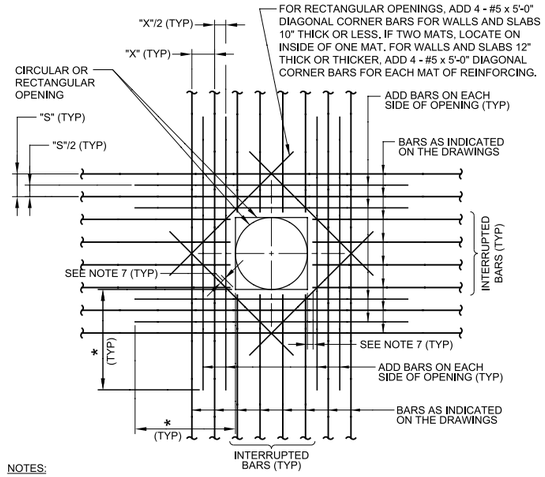


NOTES:

1. HOOKS SHALL BE ACI STD 90 DEGREE HOOKS.
2. ORIENTATION OF BARS IN LAYERS SHALL BE AS INDICATED ON THE DRAWINGS.

S144 TYP S REINFORCEMENT AT CORNERS AND JUNCTIONS OF WALLS

12/12/13

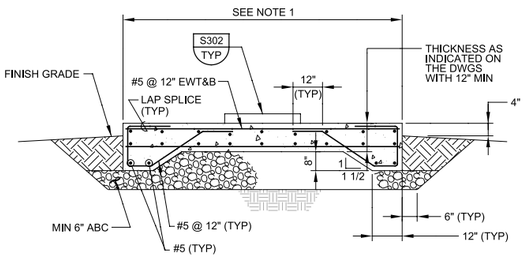


NOTES:

1. ADD BARS SHALL BE SAME SIZE AS PARALLEL BARS BEING CUT.
2. AREA OF ADD BARS AT EACH EDGE OF OPENING IN EACH DIRECTION SHALL BE EQUAL TO OR GREATER THAN 1/2 THE CROSS SECTIONAL AREA OF THE INTERRUPTED BARS.
3. PROVIDE STANDARD ACI HOOKS ON BARS IF STRAIGHT EXTENSION PAST THE OPENING, CANNOT BE ACHIEVED.
4. PLACE ADD BARS IN SAME PLANES AS INTERRUPTED REINFORCING.
5. PLACE #5 DIAGONAL BARS ON INSIDE MAT OF REINFORCING.
6. * = DIMENSION EQUALS OPENING DIMENSION MEASURED PERPENDICULAR TO ADD BARS PLUS LAP SPLICE LENGTH.
7. 2" CLEAR TO CONCRETE OPENINGS OR OUTSIDE FACE OF PIPES AND PIPE SLEEVES. DO NOT OVERCUT REINFORCMENT FOR EASIER PLACEMENT OF WEEP RINGS AND FLANGES.

S180 TYP NS ADDITIONAL REINFORCING AT OPENINGS IN CONCRETE SLABS OR WALLS

07/11/13

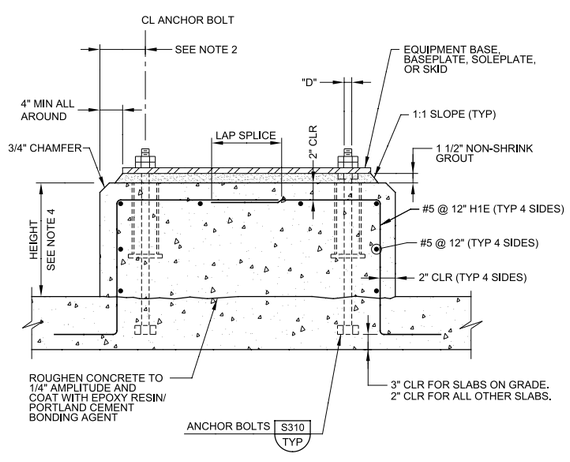


NOTE:

1. DIMENSIONS AS REQUIRED TO SUIT EQUIPMENT OR AS INDICATED ON THE DRAWINGS.

S300 TYP N EQUIPMENT SLAB

02/02/2015

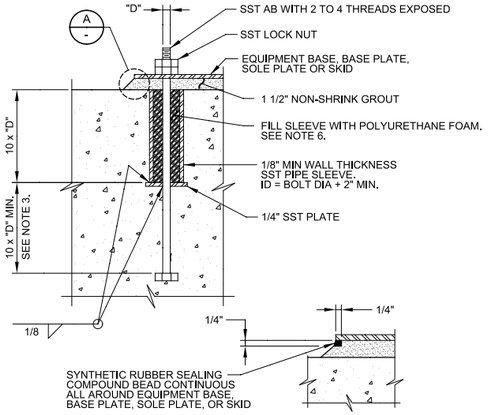


NOTES:

1. "D" = DIAMETER OF ANCHOR BOLT.
2. THE EDGE DISTANCE ON THE ANCHOR BOLTS SHALL NOT BE LESS THAN 6" OR 8 x "D".
3. PAD DIMENSIONS AND ANCHOR BOLT SIZE SHALL CONFORM TO EQUIPMENT MANUFACTURER'S REQUIREMENTS.
4. VARIES TO SUIT EQUIPMENT FURNISHED OR AS INDICATED ON THE DRAWINGS.
5. WHERE CONCRETE SLAB OR BEAM THICKNESS WILL NOT ACCOMMODATE THE ANCHOR BOLT, PROVIDE EXTRA THICKNESS FOR SLAB OR BEAM.

S302 TYP N EQUIPMENT BASE

02/02/2015



A - DETAIL

NOTES:

1. "D" = DIAMETER OF ANCHOR BOLT.
2. ANCHOR BOLT DIAMETER AS INDICATED ON THE DRAWINGS. IF NOT INDICATED ON THE DRAWINGS, THE ANCHOR BOLT SIZE SHALL BE AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER.
3. WHERE CONCRETE SLAB OR BEAM THICKNESS WILL NOT ACCOMMODATE THE ANCHOR BOLT, PROVIDE EXTRA THICKNESS OF SLAB OR BEAM.
4. PREFABRICATED PLASTIC ANCHOR BOLT SLEEVE OPTIONAL.
5. DO NOT USE ALL THREAD RODS AS A SUBSTITUTE FOR BOLTS WITH A BOLT HEAD. SMOOTH RODS THREADED AT THE ENDS MAY BE USED IF ACCEPTABLE TO THE ENGINEER. DO NOT WELD NUTS TO THE THREADED RODS.
6. COMPLETELY REMOVE ANY POLYURETHANE FOAM FROM CONCRETE, EQUIPMENT BASE, BASE PLATE, SOLE PLATE, OR SKID, AND ANCHOR BOLTS ABOVE TOP OF CONCRETE.
7. DO NOT USE LEVELING NUTS TO SUPPORT AND LEVEL EQUIPMENT BASE, BASE PLATE, SOLE PLATE, OR SKID.

S310 TYP N ANCHOR BOLT - EMBED AND SLEEVE

05/20/15

carollo

BID SET

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

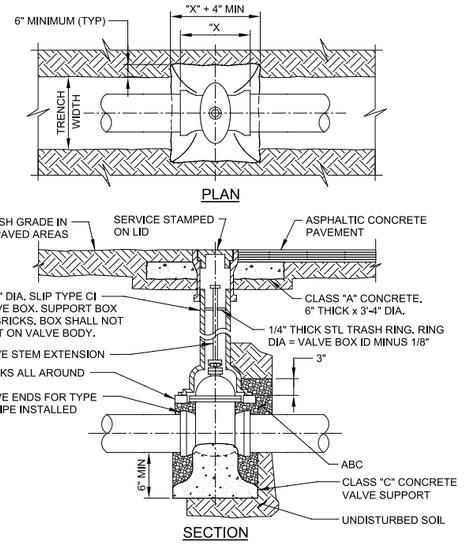
LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: GG
Drawn by: GD
Checked by: JW
Date: AUGUST 2016
Dwg scale:

TYPICAL
TYPICAL DETAILS I

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED 08/31/2016
ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number:
T-001
Sheet 33 OF 43

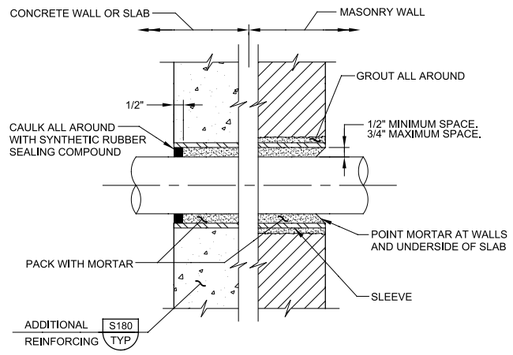


NOTES:

1. ALL BURIED VALVES SHALL BE PROVIDED WITH EXTENSION STEM OPERATION WITH 2" SQUARE AWWA NUT WITHIN 36" OF VALVE BOX COVER. NUT IS TO INDICATE DIRECTION OF ROTATION TO OPEN VALVE.
2. COAT BURIED PIPE AND VALVE BOX AS SPECIFIED.
3. CLEAN VALVE BOX OF ALL DEBRIS AND SOIL.
4. VALVE TYPE AS INDICATED ON THE DRAWINGS.

P022 TYP — VALVE BOX INSTALLATION

08/01/05



NOTES:

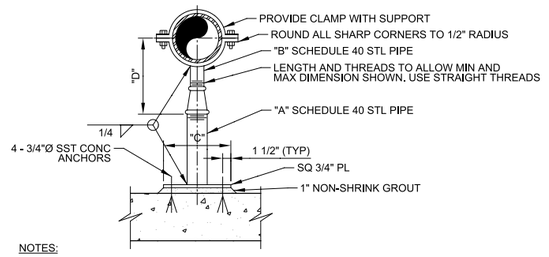
1. 6"Ø DIAMETER SLEEVES AND SMALLER SHALL BE SCHEDULE 40 STEEL PIPE OR SCHEDULE 80 PVC PIPE.
2. SLEEVES LARGER THAN 6"Ø SHALL BE 1/4" THICK STEEL PIPE.
3. STEEL SLEEVE SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
4. SLEEVES FOR ELECTRICAL CONDUIT SHALL BE SCHEDULE 80 PVC.

P302 TYP NS — SLEEVE INSTALLATION THROUGH DRY WALLS AND FLOOR SLABS

08/01/05

ADJUSTABLE PIPE SADDLE SUPPORT SCHEDULE (INCHES)

SIZE OF SUPPORTED PIPE **	PIPE SIZE "A"	PIPE SIZE "B"	"C"	"D" MINIMUM	"D" MAXIMUM
2 1/2 *	2 1/2	1 1/2	12	8	13
3	2 1/2	1 1/2	12	8 1/2	13 1/2
3 1/2	2 1/2	1 1/2	12	8 1/2	13 1/2
4	3	2 1/2	12	9 1/2	14
6	3	2 1/2	12	10 1/2	15 1/2
8	3	2 1/2	12	11 1/2	16 1/2
10	3	2 1/2	12	13 1/2	18 1/2
12	3	2 1/2	12	15	19 1/2
14	4	3	12	16 1/2	20 1/2
16	4	3	12	17 1/2	22 1/2
18	6	3 1/2	14	19 1/2	24
20	6	3 1/2	14	21	25 1/2
24	6	4	14	23 1/2	28 1/2
30	6	4	14	27	31 1/2
32	6	4	14	28 1/2	32 1/2
36	6	4	14	30 1/2	34 1/2



NOTES:

1. HOT-DIP GALVANIZED SUPPORT AFTER FABRICATION.
2. * = USE 2 1/2" SUPPORTS FOR PIPES LESS THEN 2 1/2"Ø.
3. ** = NOMINAL PIPE SIZE.

P624 TYP NS — ADJUSTABLE PIPE SUPPORT

09/04/13

carollo

BID SET

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: GG
Drawn by: GD
Checked by: JW
Date: AUGUST 2016
Dwg scale:

TYPICAL
TYPICAL DETAILS II

Registered Professional Engineer (Civil)
CERTIFICATE NO.
44630
GREG A. GOULD
DATE SIGNED 08/31/2016
ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number:
T-002
Sheet 34 OF 43

PROJECT NO. 9800A10 FILE NAME: P2-9800A10_T-002.dgn

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Model: Layout1
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ELECTRICAL PLAN SYMBOLS

IDENTIFICATION SYMBOLS

- EQUIP # — EQUIPMENT AND INSTRUMENT IDENTIFICATION
- EQUIPMENT/INSTRUMENT LOCATOR
- LUMINAIRE IDENTIFICATION
  a = CIRCUIT DESIGNATION
  b = DEVICE SWITCHED FROM
  c = MOUNTING HEIGHT IN FEET TO BOTTOM OF FIXTURE
- XXXX — CONDUIT IDENTIFICATION
  XXXX = CONDUIT NUMBER,
  REFER TO CONDUIT SCHEDULE
  UNLESS OTHERWISE NOTED, GROUPED CONDUITS ARE LABELED LEFT TO RIGHT OR TOP TO BOTTOM.
- X — INDICATES KEYNOTE X
  (PERTAINS ONLY TO SHEET WHERE NOTE IS FOUND)
- EQUIPMENT ENCLOSURE
- A — DISCONNECT SWITCH
  a = TYPE, REFER TO DISCONNECT SCHEDULE

GROUNDING

- UNDERGROUND GROUND CABLE
  #4/0 SDBC UNLESS OTHERWISE NOTED
- GROUND ROD
- GROUND ROD AND GROUND WELL
- GROUND CONNECTION

LUMINAIRES

- 2', 4', OR 8' STRIP
- 2' X 2' LAY-IN TROFFER
- 2' X 4' LAY-IN TROFFER
- LUMINAIRE POLE MOUNTED
- STROBE
  a = COLOR
  R = RED
  G = GREEN
  A = AMBER
- LUMINAIRE, EMERGENCY BATTERY-POWERED
- LUMINAIRE, EMERGENCY/EXIT BATTERY-POWERED
- LUMINAIRE, EMERGENCY BATTERY-POWERED REMOTE
- LUMINAIRE, SURFACE OR PENDANT MOUNTED
- LUMINAIRE, WALL MOUNTED
- LUMINAIRE, FLOOD/SPOT
- LUMINAIRE, EXIT ONE OR TWO FACES AS INDICATED. ARROW POINTS IN DIRECTION OF EGRESS.
- LUMINAIRE, WALL WASHER
- PE — PHOTOCELL

SWITCHES/RECEPTACLES

- SINGLE POLE SWITCH
  a = CIRCUIT DESIGNATION
  b = DEVICE SWITCHED DESIGNATION
- c = TYPE
  2 = DOUBLE POLE SWITCH
  3 = THREE-WAY SWITCH
  4 = FOUR-WAY SWITCH
  K = KEY OPERATED SWITCH
  F = SWITCH AND FUSESTAT HOLDER
  P = SWITCH AND PILOT LIGHT
  T = THERMOSTAT
  D = DIMMER SWITCH
  L = LOW VOLTAGE LIGHT SWITCH
  M = MANUAL MOTOR STARTER
- OCCUPANCY SENSOR
  a = CIRCUIT DESIGNATION
  b = DEVICE SWITCHED DESIGNATION
- SWITCH AND SINGLE RECEPTACLE
  a = CIRCUIT DESIGNATION
  b = DEVICE TYPE DESIGNATION
- DUPLEX RECEPTACLE
  a = CIRCUIT DESIGNATION
  b = DEVICE TYPE DESIGNATION
- QUADRUPLEX RECEPTACLE
  a = CIRCUIT DESIGNATION
  b = DEVICE TYPE DESIGNATION
- IN FLOOR DUPLEX RECEPTACLE
  a = CIRCUIT DESIGNATION
  b = DEVICE TYPE DESIGNATION
- IN FLOOR QUADRUPLEX RECEPTACLE
  a = CIRCUIT DESIGNATION
  b = DEVICE TYPE DESIGNATION
- DUPLEX RECEPTACLE w/SPLIT WIRE
  a = CIRCUIT DESIGNATION
  b = DEVICE TYPE DESIGNATION
- APPLIANCE RECEPTACLE
  a = CIRCUIT DESIGNATION
  b = DEVICE TYPE DESIGNATION
- WELDING RECEPTACLE
  a = CIRCUIT DESIGNATION
  b = DISCONNECT TYPE
- SPECIAL PURPOSE RECEPTACLE
  a = CIRCUIT DESIGNATION
  b = DEVICE TYPE DESIGNATION
- TWIST LOCK RECEPTACLE
  a = AMP RATING
- TELEPHONE OUTLET
  a = CIRCUIT DESIGNATION
  b = MOUNTING HEIGHT
- DATA COMMUNICATIONS OUTLET
  a = CIRCUIT DESIGNATION
  b = MOUNTING HEIGHT

FIRE ALARM

- SMOKE DETECTOR
  a = TYPE
  I = IONIZATION
  P = PHOTOELECTRIC
  d = DUCT DETECTOR
- FACP — FIRE ALARM CONTROL PANEL
- F — FIRE ALARM PULL STATION
- F — FIRE ALARM HORN/STROBE COMBINATION
- F — FIRE ALARM STROBE
- F — FIRE SPRINKLER
  F = FLOW SWITCH
  T = TAMPER SWITCH

RACEWAY

- EXPOSED CONDUIT
- BREAK AND CONTINUATION IN CONDUIT RUN
- EXPOSED CONDUIT HIDDEN BEHIND WALLS, FLOORS OR OTHER STRUCTURES
- UNDERGROUND CONDUIT, DIRECT BURIED OR IN DUCTBANK
- CONDUIT IN SLAB
- CONDUIT VERTICAL CHANGE IN DIRECTION
- CONDUIT CAP
- J — JUNCTION BOX
- CONDUIT SEAL
- CONDUIT TEE
- DUCTBANK
  APPROXIMATE DIMENSIONS
  SHOWN ON DUCTBANK SCHEDULE

CONDUIT SIZE AND CONDUCTORS

INDIVIDUAL CONDUCTORS

W"C-(3-X (Ø), 1-Y (N) & 1-Z (G))

W"C (WHERE INDICATED): W = CONDUIT TRADE SIZE

3-X (Ø):
3 = QUANTITY
X = SIZE OF CONDUCTORS
(Ø) = DESIGNATES PHASE CONDUCTORS

1-Y (N)(WHERE INDICATED):
1 = QUANTITY
Y = SIZE OF CONDUCTORS
(N) = DESIGNATES NEUTRAL CONDUCTORS

1-Z (G)(WHERE INDICATED):
1 = QUANTITY
Z = SIZE OF CONDUCTORS
(G) = DESIGNATES GROUND CONDUCTORS

U(3-X (Ø) & 1-X (G))

U = NUMBER OF PARALLEL RUNS

MULTI CONDUCTOR CABLES

K/2/C#16S
K (WHERE INDICATED) = NUMBER OF PAIRS
2/C#16S = TWO CONDUCTOR, 16 GAUGE, TWISTED SHIELDED PAIR

K/3/C#16S
K (WHERE INDICATED) = NUMBER OF TRIPLETS
3/C#16S = THREE CONDUCTOR, 16 GAUGE, TWISTED SHIELDED TRIPLETS

N/CX
N = NUMBER OF CONDUCTORS IN THE CABLE
X = SIZE OF CONDUCTORS

FIBER OPTIC CABLES

FO/N
N = NUMBER OF INDIVIDUAL FIBERS

ELECTRICAL ONE-LINE SYMBOLS

MEDIUM VOLTAGE

- 52 — CIRCUIT BREAKER, MEDIUM VOLTAGE
  a = CIRCUIT BREAKER NUMBER
  b = FRAME SIZE
- ANSI RELAY DEVICE
  a = ANSI DEVICE FUNCTION
  b = QUANTITY
- MEDIUM VOLTAGE DISCONNECT SWITCH NON-FUSED CUT OUT
- MEDIUM VOLTAGE DISCONNECTING FUSE SINGLE FUSE CUT OUT
- MEDIUM VOLTAGE DISCONNECTING FUSE DOUBLE FUSE CUT OUT
- MEDIUM VOLTAGE SINGLE FUSE
- MEDIUM VOLTAGE DOUBLE FUSE
- MEDIUM VOLTAGE LIVE FRONT TERMINATOR
- MEDIUM VOLTAGE ELBOW
- MEDIUM VOLTAGE TEE
- MEDIUM VOLTAGE CONTACTOR
- MEDIUM VOLTAGE STARTER
- MOV-ELBOW ARRESTER

LOW VOLTAGE

- LOW VOLTAGE CIRCUIT BREAKER
  a = TYPE
  MCP = MOTOR CIRCUIT PROTECTOR
  TM = THERMAL MAGNETIC
  SS = SOLID STATE
  b = FRAME SIZE (MANUFACTURER TO DETERMINE FRAME SIZE UNLESS INDICATED)
  c = NUMBER OF POLES
  d = TRIP SETTING (AT = AMP TRIP)
  (AC = MCP CONTINUOUS RATING)
  e = DESIGNATION
  f = INTERRUPTING RATING
- LOW VOLTAGE CIRCUIT BREAKER
  AUXILIARY OPERATOR
  * = S = SHUNT TRIP
  = G = GROUND FAULT INTERRUPTER
  = V = SOLENOID KEY RELEASE
- A — DISCONNECT SWITCH
  A = TYPE, REFER TO DISCONNECT SCHEDULE
- B — FUSED DISCONNECT SWITCH
  B = TYPE, REFER TO DISCONNECT SCHEDULE
  b = FUSE RATING
- FUSE
- COMBINATION STARTER
  a = CIRCUIT BREAKER DISCONNECT, TYPE AS NOTED
  b = CONTACTOR TYPE
  FVNR = FULL VOLTAGE NON-REVERSING
  FVR = FULL VOLTAGE NON-REVERSING
  TS1W = TWO SPEED SINGLE WINDING
  TS2W = TWO SPEED TWO WINDING
  LC = LIGHTING CONTACTOR
  c = NEMA STARTER SIZE
  d = OVERLOAD
- MOTOR STARTER/DRIVES:
  a = DEVICE TYPE
  VFD-6 = 6-PULSE VFD
  VFD-18 = 18-PULSE VFD
  RVSS = REDUCED VOLTAGE SOLID STATE STARTER
  RVAT = REDUCED VOLTAGE AUTO TRANSFORMER
  a/B = DEVICE WITH BYPASS STARTER, REFER TO THE SPECIFICATIONS
  b = INPUT OPTIONS
  LL = LINE REACTOR
  PHF = PASSIVE HARMONIC FILTER
  c = OUTPUT OPTIONS
  LR = LOAD REACTOR
  DV/DT = Dv/dt FILTER
  SWF = SINE WAVE FILTER

MISCELLANEOUS

- HP — MOTOR
  HP = HORSEPOWER RATING
  FULL LOAD AMPS AS NOTED
- PACKAGED EQUIPMENT
  LOAD RATING AS INDICATED
  a = RATED LOAD
  b = UNIT(HP, KW, KVA) AS INDICATED
- TRANSFORMER
  a = DEVICE I.D.
  b = KVA RATING
  c = NUMBER OF PHASES
  d = PRIMARY VOLTAGE
  e = SECONDARY VOLTAGE
  f,g = CONNECTION TYPE SYMBOL
  h = IMPEDANCE
- GROUNDED WYE CONNECTION
- DELTA CONNECTION
- G — ENGINE-GENERATOR RATINGS AS INDICATED ON THE DRAWINGS
  a = KVA/KW
  b = VOLTAGE/CONNECTION
  c = PHASE
  d = WIRE
  e = PF
- CURRENT TRANSFORMER WITH SHORTING TERMINAL BLOCK
  a = QUANTITY
  b = RATIO
- POTENTIAL TRANSFORMER
  a = QUANTITY
  b = RATIO
  c,d = CONNECTION TYPE SYMBOL
- SSM — SOLID STATE MULTIFUNCTION METER
- ATP — AMPERE TEST POINT
- VTP — VOLTAGE TEST POINT
- UTILITY METER
- LIGHTNING ARRESTER
- SPD — SURGE PROTECTIVE DEVICE
- DRAWOUT CONNECTION
- GROUND
- CAPACITOR
- BATTERY
- K — KIRK KEY INTERLOCK
- LOAD BANK

carollo

BID SET

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by:	KJA
Drawn by:	VYJ
Checked by:	MJP
Date:	AUGUST 2016
Dwg scale:	

ELECTRICAL
LEGEND
POWER PLAN

Registered Professional Engineer — CERTIFICATE NO. 53655 — KEVIN JEFFREY ANGLE — DATE SIGNED — ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number:
E-001
Sheet 35 OF 43

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PROJECT NO. 9800A10
FILE NAME: P2-9800A10_E-001.dgn

ABBREVIATIONS

A	AMP
ABS	ABSOLUTE
AC	ALTERNATING CURRENT
ACK	ACKNOWLEDGE
ACTR	ACTUATOR
AF	AMP FRAME
AFC	AUTOMATIC FREQUENCY CONTROL
AIC	AMP INTERRUPTING CAPACITY
AM	AMMETER
ANN	ANNUNCIATOR
ANT	ANTENNA
APU	AUXILIARY POWER UNIT
ARM	ARMORED CABLE
AS	AMMETER SWITCH
ASYM	ASYMMETRICAL
AT	AMP TRIP
ATO	AUTOMATIC THROW OVER
ATP	AMMETER TEST POINT
ATS	AUTOMATIC TRANSFER SWITCH
AUTO XFMR	AUTOMATIC TRANSFORMER
AUX	AUXILIARY
AWG	AMERICAN WIRE GAGE
B	BELL
BAT	BATTERY
BFG	BELOW FINISHED GRADE
BHP	BRAKE HORSEPOWER
BKR	BREAKER
BRF	BELOW RAISED FLOOR
C	CONDUIT / CONTINUOUS LOAD
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CCW	COUNTER CLOCKWISE
CKT	CIRCUIT
COAX	COAXIAL CABLE
COM	COMMON
COMM	COMMUNICATION
CPT	CONTROL POWER TRANSFORMER
CS	CONTROL SWITCH
CT	CURRENT TRANSFORMER
CV	CONTROL VALVE
CW	CLOCKWISE / COOL WHITE
DC	DIRECT CURRENT
DCS	DISTRIBUTED CONTROL SYSTEM
DCU - X	DISTRIBUTED CONTROL UNIT NO. X
DEMO	DEMOLITION
DISC	DISCONNECT SWITCH
DM	DEMAND METER
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DS	DOOR SWITCH
E/G	EMERGENCY GENERATOR
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
ENG	ENGINE
ENT	ELECTRICAL NON-METALLIC TUBING
EP	EXPLOSION PROOF
ETM	ELAPSED TIME METER
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FDR	FEEDER
FLA	FULL LOAD AMPS
FLX	FLEXIBLE CONDUIT
FO	FIBER OPTIC
FRC	FIBERGLASS RIGID CONDUIT
FREQ	FREQUENCY
FU	FUSE
FU	SW FUSED SWITCH
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
FWD	FORWARD
G	GROUND / EQUIPMENT GROUND / GROUND FAULT
GEN	GENERATOR
GRC	GALVANIZED STEEL RIGID CONDUIT
GFCI	GROUND FAULT CIRCUIT INTERRUPTER (RECEPTACLE)
GFI	GROUND FAULT INTERRUPTER (BREAKER)
GFR	GROUND FAULT RELAY
H	HOT-LEG
HF	HIGH FREQUENCY
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HR	HOUR
HSTAT	HUMIDISTAT
HV	HIGH VOLTAGE
HVAC	HEATING/VENTILATION/AIR CONDITIONING
HZ	HERTZ
I	INSTANTANEOUS LOAD
IC	INTERRUPTING CAPACITY
IJB	INSTRUMENT JUNCTION BOX
IMC	INTERMEDIATE METAL CONDUIT
INST	INSTANTANEOUS
INT	INTERLOCK
INTERCOM	INTERCOMMUNICATION
J	JUNCTION BOX
K	KEY INTERLOCK
KA	KILOAMP
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAR	KILOVAR (REACTANCE)
KW	KILOWATT
KWD	KILOWATT DEMAND
KWH	KILOWATT HOUR
L	LONG-TIME
L-B	LINE-BUS
L-G	LINE-GROUND
LA	LIGHTNING ARRESTOR
LBL	LABEL
LC	LIGHTING CONTACT OR
LCP- X	LOCAL CONTROL PANEL NO. X
LL	LEAD-LAG LOAD REACTOR
LP	LIGHT POLE
LP - X	LIGHTING PANEL NO. X
LTG	LIGHTING
LV	LOW VOLTAGE
LVL	LEVEL
M-X	MOTOR CONTROLLER NO. X
MA	MILLIAMPERE
MCA	MOTOR CIRCUIT AMPS
MCC - X	MOTOR CONTROL CENTER NO. X
MCP	MOTOR CIRCUIT PROTECTOR
MH	MANHOLE / MOUNTING HEIGHT
MLO	MAIN LUGS ONLY
MOD	MOTOR OPERATED DAMPER
MOV	METAL OXIDE VARISTOR
MRP	MOTOR PROTECTION RELAY
MS-X	MOTOR STARTER NO. X
MSP	MOTOR STARTING PANEL
MTO	MANUAL THROW OVER
MTR-X	MOTOR NO. X
MTS	MANUAL TRANSFER SWITCH
MV	MEGAVOLT
MVA	MEGAVOLT-AMPERES
MVS	MEDIUM VOLTAGE SWITCH
MW	MEGAWATT
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NFC	NONMETALLIC FLEXIBLE CONDUIT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NP	NAMEPLATE
O	OPEN OR OPENED
OH	OVERHEAD
OL	OVERLOAD RELAY
P	POLE
PA	PUBLIC ADDRESS
PB	PUSHBUTTON / PULL BOX
PCS	PVC COATED GALVANIZED STEEL CONDUIT
PCM	PROCESS CONTROL MODULE
PE	PHOTOCELL
PF	POWER FACTOR
PFCC	POWER FACTOR CORRECTION CAPACITOR
PFR	PHASE FAILURE RELAY
PH	PHASE
PNL	PANEL
PPX	POWER PANEL NO. X
PRI	PRIMARY
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE RIGID PLASTIC CONDUIT
PWR	POWER
RAC	RIGID ALUMINUM CONDUIT
RECPT	RECEPTACLE
REV	REVERSE
RF	RADIO FREQUENCY
RMS	ROOT MEAN SQUARED
RVAT	REDUCED VOLTAGE AUTO TRANSFORMER
RVNR	REDUCED VOLTAGE NON-REVERSING
RVSS	REDUCED VOLTAGE SOLID STATE
S	SHIELD / SHORT-TIME
SA	SURGE ARRESTER
SC	SHORT CIRCUIT
SDBC	SOFT DRAWN BARE COPPER
SFL	SUB FEED LUGS
SLT	SEALTIGHT LIQUIDTIGHT FLEXIBLE CONDUIT
SM	SURFACE MOUNTED
SP	SINGLE POLE
SPD	SURGE PROTECTIVE DEVICE
SPDT	SINGLE POLE DOUBLE THROW
SPST	SINGLE POLE SINGLE THROW
SPKR	SPEAKER
SS	SOLID STATE
STB	SHORTING TERMINAL BLOCK
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRICAL
TACH	TACHOMETER
TB - X	TERMINAL BLOCK - UNIT X
TC	THERMOCOUPLE / TIME CLOCK / TRAY CABLE
TD	TEMPERATURE DETECTOR RELAY
TE	TOTALLY ENCLOSED
TEFC	TOTALLY ENCLOSED FAN COOLED
TENV	TOTALLY ENCLOSED NON-VENTILATED
TERM	TERMINAL
TJB	TERMINAL JUNCTION BOX
TM	THERMAL MAGNETIC
TP	TWISTED PAIR
TS	TEMPERATURE SWITCH
TS1W	TWO SPEED CONSEQUENT POLE, ONE WINDING
TS2W	TWO SPEED SEPARATE WINDING
TSTAT	THERMOSTAT
UHF	ULTRA HIGH FREQUENCY
UNG	UNGROUNDED
UPS	UNINTERRUPTABLE POWER SUPPLY
UVR	UNDER VOLTAGE RELAY
V	VOLT
VA	VOLT AMPERE
VAR	VARMETER
VCP	VENDOR CONTROL PANEL
VFD	VARIABLE FREQUENCY DRIVE
VHF	VERY HIGH FREQUENCY
VM	VOLTMETER
VP	VAPORPROOF
VR	VOLTAGE REGULATOR
VS	VOTAGE SWITCH
VT	VOLTAGE TRANSFORMER
VTP	VOLTAGE TEST POINT
W	WATT / WEST
WT	WATER TIGHT
WP	WEATHER PROOF
XFMR	TRANSFORMER

NOTES:

1. REFER TO SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL ABBREVIATIONS.

POWER DEVICE FUNCTION NUMBERS

1	MASTER ELEMENT
2	TIME-DELAY STARTING OR CLOSING RELAY
3	CHECKING OR INTERLOCKING RELAY
4	MASTER CONTACTOR
5	STOPPING DEVICE
6	STARTING CIRCUIT BREAKER
7	ANODE CIRCUIT BREAKER
8	CONTROL POWER DISCONNECTING DEVICE
9	REVERSING DEVICE
10	UNIT SEQUENCE SWITCH
11	MULTIFUNCTION DEVICE
12	OVER-SPEED DEVICE
13	SYNCHRONOUS-SPEED DEVICE
14	UNDER-SPEED DEVICE
15	SPEED OR FREQUENCY MATCHING DEVICE
16	DATA COMMUNICATIONS DEVICE
17	SHUNTING OR DISCHARGE SWITCH
18	ACCELERATING OR DECELERATING DEVICE
19	STARTING-TO-RUNNING TRANSITION CONTACTOR
20	ELECTRICALLY OPERATED VALVE
21	DISTANCE RELAY
22	EQUALIZER CIRCUIT BREAKER
23	TEMPERATURE CONTROL DEVICE
24	VOLTS PER HERTZ RELAY
25	SYNCHRONIZING OR SYNCHRONISM-CHECK DEVICE
26	APPARATUS THERMAL DEVICE
27	UNDERVOLTAGE RELAY
27N	GROUND FAULT UNDERVOLTAGE RELAY
28	FLAME DETECTOR
29	ISOLATING CONTACTOR
30	ANNUNCIATOR RELAY
31	SEPARATE EXCITATION DEVICE
32	DIRECTIONAL POWER RELAY
33	POSITION SWITCH
34	MASTER SEQUENCE DEVICE
35	BRUSH-OPERATING OR SLIP-RING SHORT-CIRCUITING DEVICE
36	POLARITY DEVICE
37	UNDERCURRENT OR UNDERPOWER RELAY
38	BEARING PROTECTIVE DEVICE
39	MECHANICAL CONDITION MONITOR
40	FIELD RELAY
41	FIELD CIRCUIT BREAKER
42	RUNNING CIRCUIT BREAKER
43	MANUAL TRANSFER OR SELECTOR DEVICE
44	UNIT SEQUENCE STARTING RELAY
45	ABNORMAL ATMOSPHERIC CONDITION MONITOR
46	REVERSE-PHASE OR BALANCE CURRENT RELAY
47	PHASE-BALANCE OR PHASE-SEQUENCE VOLTAGE RELAY
48	INCOMPLETE SEQUENCE RELAY
49	MACHINE OR TRANSFORMER THERMAL RELAY
50	INSTANTANEOUS OVERCURRENT RELAY
51	AC TIME OVERCURRENT RELAY
52	AC CIRCUIT BREAKER
53	FIELD EXCITATION RELAY
54	TURNING GEAR ENGAGING DEVICE
55	POWER FACTOR RELAY
56	FIELD APPLICATION RELAY
57	SHORT-CIRCUITING OR GROUNDING DEVICE
58	RECTIFICATION FAILURE RELAY
59	OVERVOLTAGE RELAY
60	VOLTAGE OR CURRENT BALANCE RELAY
61	DENSITY SWITCH OR SENSOR
62	TIME-DELAY STOPPING OR OPENING RELAY
63	PRESSURE SWITCH
64	GROUND DETECTOR RELAY
65	GOVERNOR
66	NOTCHING OR JOGGING DEVICE
67	AC DIRECTIONAL OVERCURRENT RELAY
68	BLOCKING OR OUT OF STEP RELAY
69	PERMISSIVE CONTROL DEVICE
70	RHEOSTAT
71	LIQUID LEVEL SWITCH
72	DC CIRCUIT BREAKER
73	LOAD-RESISTOR CONTACTOR
74	ALARM RELAY
75	POSITION CHANGING MECHANISM
76	DC OVERCURRENT RELAY
77	TELEMETERING DEVICE
78	PHASE-ANGLE MEASURING RELAY
79	AC RECLOSING RELAY
80	FLOW SWITCH
81	FREQUENCY RELAY
82	DC LOAD MEASURING RECLOSING RELAY
83	AUTOMATIC SELECTIVE CONTROL OR TRANSFER RELAY
84	OPERATING MECHANISM
85	PILOT COMMUNICATIONS, CARRIER OR PILOT-WIRE RELAY
86	LOCKOUT RELAY
87	DIFFERENTIAL PROTECTIVE RELAY
88	AUXILIARY MOTOR OR MOTOR GENERATOR
89	LINE SWITCH
90	REGULATING DEVICE
91	VOLTAGE DIRECTIONAL RELAY
92	VOLTAGE AND POWER DIRECTIONAL RELAY
93	FIELD-CHANGING CONTACTOR
94	TRIPPING OR TRIP-FREE RELAY

COMMONLY USED SUFFIX LETTERS APPLIED TO POWER DEVICE FUNCTION NUMBERS

A	ALARM ONLY
B	BUS PROTECTION
G	GROUND FAULT PROTECTION (RELAY CT IN A SYSTEM NEUTRAL CIRCUIT OR GENERATOR PROTECTION)
GS	GROUND FAULT PROTECTION (RELAY CT IN TOROIDAL OR GROUND SENSOR TYPE)
L	LINE PROTECTION
M	MOTOR PROTECTION
N	GROUND FAULT PROTECTION (RELAY COIL CONNECTED IN RESIDUAL CT CIRCUIT)
T	TRANSFORMER PROTECTION
V	VOLTAGE
P	PHASE PROTECTION

ABBREVIATIONS

AFD	- ARC FLASH DETECTOR
CLK	- CLOCK OR TIMING SOURCE
DDR	- DYNAMIC DISTURBANCE RECORDER
DFR	- DIGITAL FAULT RECORDER
ENV	- ENVIRONMENTAL DATA
HIZ	- HIGH IMPEDANCE FAULT DETECTOR
HMI	- HUMAN MACHINE INTERFACE
HST	- HISTORIAN
LGC	- SCHEME LOGIC
MET	- SUBSTATION METERING
PDC	- PHASOR DATA CONCENTRATOR
PMU	- PHASOR MEASUREMENT UNIT
PQM	- POWER QUALITY MONITOR
RIO	- REMOTE I/O DEVICE
RTU	- REMOTE TELEMETRY UNIT/REMOTE TERMINAL UNIT
SER	- SEQUENCE OF EVENTS RECORDER
TCM	- TRIP CIRCUIT MONITOR

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: KJA
Drawn by: VYJ
Checked by: MJP
Date: AUGUST 2016
Dwg scale:

ELECTRICAL
ABBREVIATIONS
POWER PLAN

Registered Professional Engineer
CERTIFICATE NO.
53655
KEVIN JEFFREY ANGLE
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2018

carollo

BID SET

Sheet Number:
E-002
Sheet 36 OF 43

Plot Date: 31-AUG-2016 3:24:54 PM
User: jmireles
PlotScale: 2:1
DesignScript: Carollo_Std_Pen_v0905.pen
ColorTable: gshade.ctb
Model: Layout1
LAST SAVED BY: JMireles

PROJECT NO. 9800A10 FILE NAME: P2-9800A10_E-002.dgn

MISCELLANEOUS

1. IT IS THE INTENT OF THESE SPECIFICATIONS THAT THE ENTIRE ELECTRICAL AND CONTROL SYSTEMS BE COMPLETE AND OPERATING, INCLUDING ALL NECESSARY MATERIAL AND LABOR FOR THE COMPLETE CONNECTION FROM SOURCE OF POWER TO FINAL UTILIZATION EQUIPMENT, WHETHER OR NOT SPECIFICALLY MENTIONED BUT WHICH ARE NECESSARY FOR SUCCESSFUL OPERATION. ANY ITEMS OMITTED BUT OBVIOUSLY REQUIRED FOR SUCCESSFUL OPERATION OF THE ELECTRICAL AND CONTROL SYSTEMS SHALL BE FURNISHED AND INSTALLED.
2. REVIEW ALL DRAWINGS FOR REQUIRED ELECTRICAL AND CONTROL SYSTEM WORK. ELECTRICAL WORK IS SPECIFIED ON CIVIL AND MECHANICAL DRAWINGS, IN ADDITION TO THE ELECTRICAL DRAWINGS.
3. PERFORM ALL WORK TO MEET THE REQUIREMENTS OF ALL LEGALLY CONSTITUTED AUTHORITIES HAVING JURISDICTION INCLUDING ALL STATE, CITY, AND COUNTY AUTHORITIES. ALL WORK SHALL BE PERFORMED SO AS TO COMPLY WITH THE LATEST EDITIONS, AMENDMENTS, PRACTICES, AND RULING OF THE NATIONAL ELECTRICAL CODE (NFPA NO 70), THE UNIFORM BUILDING CODE, AND THE LIFE SAFETY CODE.
4. CONTRACTOR MAY MAKE WRITTEN APPLICATION TO THE ENGINEER TO SUBSTITUTE FOR THE SPECIFIED ITEMS. REQUEST FOR SUBSTITUTION MUST BE MADE IN WRITING TO THE ENGINEER WITHIN FIFTEEN (15) DAYS AFTER THE EFFECTIVE DATE OF THE AGREEMENT, AND MUST CONTAIN MODEL, TYPE, OR STYLE NUMBER, CATALOG SHEETS, STANDARDS, AND ALL PERTINENT DATA FOR EACH SUBSTITUTION REQUESTED. ENGINEER'S DECISIONS OF ACCEPTABILITY OF SUBSTITUTIONS OR MODIFICATIONS IS FINAL.
5. THE DRAWINGS INDICATE, IN A DIAGRAMMATIC MANNER, THE DESIRED LOCATIONS, AND ARRANGEMENTS OF THE COMPONENTS OF THE ELECTRICAL WORK. FOLLOW THE DRAWINGS AS CLOSELY AS POSSIBLE, BUT USE JUDGEMENT AND COORDINATE WITH THE OTHER TRADES TO SECURE THE BEST POSSIBLE INSTALLATION IN THE AVAILABLE SPACE AND UNDER THE DEVELOPED CONDITIONS.
6. BEFORE INSTALLING ANY CONDUIT OR LOCATING ANY ELECTRICAL EQUIPMENT, EXAMINE THE COMPLETE SET OF DRAWINGS AND SPECIFICATIONS AND VERIFY ALL DIMENSIONS AND SPACE REQUIREMENTS. MAKE SUCH MINOR ADJUSTMENTS THAT MAY BE NECESSARY TO AVOID CONFLICTS WITH THE BUILDING STRUCTURE OR THE WORK OF OTHER TRADES.
7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO STUDY ALL DRAWINGS AND SPECIFICATIONS AND TO REPORT ANY ERRORS, OMISSIONS, AND/OR POINTS OF CONFLICT WITH OTHER TRADES PRIOR TO BIDDING.
8. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING AND EXAMINE THE PREMISES CAREFULLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE FULLY FAMILIAR WITH THE EXISTING CONDITIONS AND LOCAL REQUIREMENTS AND REGULATIONS. DIFFICULTIES THAT ARISE AFTER THE CONTRACT HAS BEEN AWARDED WHICH COULD HAVE BEEN AVOIDED BY A MORE COMPLETE INITIAL SITE VISIT ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE CORRECTED BY THE CONTRACTOR WITHOUT ANY ADDITIONAL COSTS TO THE OWNER.
9. EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE, PROVIDE ONLY NEW MATERIALS HAVING ALL LEGALLY REQUIRED APPROVALS AND/OR LABELS. ITEMS OF SIMILAR NATURE MUST BE OF THE SAME TYPE AND MANUFACTURER.
10. EQUIPMENT OR MATERIAL DAMAGED PRIOR TO FINAL INSPECTION AND ACCEPTANCE BY THE ENGINEER SHALL BE REPLACED IN A MANNER APPROVED BY THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
11. DO ALL CUTTING, PATCHING, CHANNELING, CORE DRILLING, AND FITTING REQUIRED OF THE ELECTRICAL WORK, EXCEPT AS OTHERWISE DIRECTED. SECURE THE PERMISSION OF THE ENGINEER BEFORE PERFORMING ANY OPERATION LIKELY TO AFFECT THE STRENGTH OF A STRUCTURAL MEMBER.
12. PROTECT ELECTRICAL WORK AT ALL TIMES FROM DAMAGE, DEFACEMENT, OR DETERIORATION FROM ANY CAUSE WHATSOEVER, PROVIDE PROPER STORAGE FACILITIES AND CONDUCT OPERATIONS TO THIS EFFECT. PERFORM ELECTRICAL WORK IN SUCH A MANNER AS TO PROTECT THE WORK OF OTHER TRADES. REPAIR OR REPLACE DAMAGED ELECTRICAL WORK AND BE RESPONSIBLE FOR THE CORRECTION OF ANY DAMAGE DONE IN THE PERFORMANCE OF THE ELECTRICAL WORK TO THE WORK OF OTHER TRADES.
13. THE CONTRACTOR SHALL ABIDE BY ALL SECURITY RULES AND OTHER RULES CONCERNING THE USE OF THE EXISTING PREMISES AS DICTATED BY THE OWNER.
14. KEEP OUTAGES TO OCCUPIED AREAS TO A MINIMUM AND PREARRANGE ALL OUTAGES WITH THE OWNER'S REPRESENTATIVE. REQUESTS FOR OUTAGES SHALL STATE THE SPECIFIC DATES AND HOURS AND THE MAXIMUM DURATION, WITH THE OUTAGES KEPT TO THESE SPECIFIC TIMES. CONTRACTOR WILL BE LIABLE FOR ANY DAMAGES RESULTING FROM UNSCHEDULED OUTAGES OR FOR THOSE NOT CONFINED TO THE PRE-APPROVED TIMES. INCLUDE ALL COSTS FOR OVERTIME LABOR AS NECESSARY TO MAINTAIN ELECTRICAL SERVICES IN THE INITIAL BID PROPOSAL. TEMPORARY WIRING AND FACILITIES, IF USED, SHALL BE REMOVED AND THE SITE LEFT CLEAN BEFORE FINAL ACCEPTANCE.
15. WHEN THE WORK IS SUBSTANTIALLY COMPLETE, AND AT A TIME SELECTED BY THE OWNER'S REPRESENTATIVE, CONDUCT AN OPERATING TEST IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE, THAT DEMONSTRATES THAT ALL EQUIPMENT AND SYSTEMS OPERATE IN ACCORDANCE WITH REQUIREMENTS OF THE PLANS AND SPECIFICATIONS, AND ARE FREE OF ELECTRICAL AND MECHANICAL DEFECTS.
16. THE CONTRACTOR SHALL FURNISH TWO SETS OF OPERATING MANUALS WITH A NARRATIVE DESCRIPTION OF OPERATION. AFTER THE OPERATIONAL TESTS, THE CONTRACTOR SHALL SUBMIT REVISED MATERIALS FOR THESE MANUALS TO ADDRESS ALL CHANGES REQUESTED BY THE ENGINEER AND ALL CHANGES MADE DURING TESTING AND START UP, PLUS TWO ADDITIONAL COMPLETE MANUALS.
17. THE CONTRACTOR WILL FURNISH A WRITTEN GUARANTEE TO THE OWNER, EFFECTIVE FOR A PERIOD OF TIME AS DEFINED BY THE GENERAL CONDITIONS FOR ALL WARRANTY REQUIREMENTS.
18. THE ELECTRICAL DRAWINGS SHALL NOT BE USED FOR ROOM DIMENSIONS, OR EQUIPMENT PLACEMENT, REFERENCE THE APPROPRIATE MECHANICAL PLANS. DRAWINGS ARE SCHEMATIC VERIFY ALL LOCATIONS WITH FIELD ENGINEER BEFORE INSTALLING CONDUIT, EQUIPMENT, ETC.
19. DETAILS ARE TYPICAL OF THE INSTALLATION, HOWEVER NOT EVERY SITUATION CAN BE DETAILED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE FAMILIAR WITH THE INSTALLATION AND TO PROVIDE THE PROPER INSTALLATION FOR ANY GIVEN SITUATION, WHICH MAY VARY, FROM THE DETAILS OR THE DRAWINGS. CONTRACTORS ARE ADVISED TO COMPLETELY SURVEY THE WORK AREA FOR PROBLEM SITUATIONS ETC.
20. IN CASE OF INTERFERENCE BETWEEN ELECTRICAL EQUIPMENT SHOWN ON THE DRAWINGS AND THE OTHER EQUIPMENT, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IN WRITING AND THE ENGINEER SHALL REVIEW THE PROPOSED CHANGES BEFORE THEY ARE MADE.
21. PACKAGE EQUIPMENT, SOME CONDUITS AND WIRE ARE SHOWN ON THE DRAWINGS, BUT IT IS EXPECTED THAT EQUIPMENT MANUFACTURERS TO COMPLETE INSTALLATIONS MAY REQUIRE SOME ADDITIONAL CONDUITS AND WIRES. IT IS INCUMBENT UPON THE CONTRACTOR TO COORDINATE THIS REQUIREMENT WITH THEIR SUBCONTRACTORS TO MAKE SURE THAT THE EQUIPMENT SUPPLIER PROVIDES ALL NECESSARY ELECTRICAL INFORMATION TO THE ELECTRICAL SUBCONTRACTOR FOR INCLUSION OF COSTS IN BID PACKAGE. ALL NECESSARY MATERIALS AND LABOR TO COMPLETE ELECTRICAL INSTALLATION SHALL BE PROVIDED WHETHER SHOWN OR NOT SHOWN ON THE DRAWINGS. ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH ALL CODES AND STANDARDS. ANY ADDITIONS OR DELETIONS MUST BE SHOWN ON THE RECORD DRAWINGS.
22. EQUIPMENT DIMENSIONS SHOWN ON PLANS AND ELEVATIONS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL USE THE SHOP DRAWINGS FOR PROPER LAYOUT AND FINAL INSTALLATION, FOUNDATION AND PAD, ETC. ANY SUCH MODIFICATIONS SHALL BE WITHOUT ANY ADDITIONAL COST TO THE OWNER.
23. PROVIDE ALL ELECTRICAL WORK IN ACCORDANCE WITH THE FOLLOWING TABLE, UNLESS OTHERWISE SPECIFICALLY INDICATED ON THE DRAWINGS:

PLANT AREA	NEMA ENCLOSURE TYPE	EXPOSED CONDUIT TYPE	ENVIRONMENT W = WET D = DAMP C = CLEAN/DRY X = CORROSIVE H = HAZARDOUS	SUPPORT MATERIALS
ELECTRICAL ROOMS	NEMA 12	GRC	C	GALVANIZED STEEL
MULBERRY & ISLAND WWTP OUTDOOR AREAS	NEMA 4X	PCS	X	STAINLESS STEEL
OUTDOOR AREAS FOR IRRIGATION	NEMA 4	GRC	W	GALVANIZED STEEL

RACEWAY AND ENCLOSURES

1. PROVIDE ONLY NEW CONDUIT WITH UL LISTING OR LABEL AND DELIVER TO THE SITE IN STANDARD LENGTHS. UNLESS OTHERWISE INDICATED, PROVIDE CONDUITS FOR ALL TYPES OF CONDUCTORS OR CABLES FOR ALL SYSTEMS AND VOLTAGE. ALL CONDUITS MUST BE REAMED CLEAR AND FREE OF ANY BURRS BEFORE INSTALLATION.
2. CONDUIT SIZES NOT INDICATED ON THE DRAWINGS SHALL BE IN ACCORDANCE WITH NEC REQUIREMENTS AND SHALL BE SIZED BASED ON QUANTITIES AND SIZES OF WIRE INSTALLED THEREIN. INCREASE CONDUIT SIZE AS REQUIRED TO ACCOMODATE THE MANDATORY GROUNDING CONDUCTOR, INSTALLED THEREIN. A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IS MANDATORY IN ALL RACEWAYS. THE CONDUIT SYSTEM IS NOT AN ALLOWABLE GROUND.
3. GALVANIZED RIGID CONDUIT MANUFACTURER IN ACCORDANCE WITH UL-6 AND ANSI C80.1, HOT-DIP GALVANIZED INSIDE AND OUT, ELECTRO-GALVANIZING IS NOT ACCEPTABLE, ALL THREADS SHALL BE NPT STANDARD CONDUIT THREADS WITH 3/4-INCH TAPER PER FOOT. RUNNING CONDUIT THREADS ARE NOT ACCEPTABLE.
4. LIQUIDTIGHT FLEXIBLE CONDUIT MANUFACTURED FROM SINGLE STRIP STEEL HOT DIP GALVANIZED ON ALL FOUR SIDES PRIOR TO CONDUIT FABRICATION WITH OVERALL POLYVINYL CHLORIDE PLASTIC JACKET. PROVIDE INSULATING CONNECTORS, APPLETON STN SERIES, OR EQUAL. USE LIQUIDTIGHT FLEXIBLE CONDUIT: WHERE INDICATED; FOR FINAL CONNECTIONS TO MOTORS; VIBRATING EQUIPMENT; WHERE REQUIRED FOR EQUIPMENT SERVICING, IN KITCHENS, DAMP LOCATIONS, OR AREAS EXPOSED TO THE WEATHER, USE LIQUIDTIGHT TYPE OF FLEXIBLE CONDUIT PROVIDED THE JACKET TEMPERATURE LIMITATIONS WILL NOT BE EXCEEDED. SIZE ALL CONDUITS AS LEGALLY REQUIRED OR LARGER WHERE INDICATED OR PREFERRED. WHERE PORTIONS OF A CONDUIT RUN ARE INCREASED IN SIZE, FOR WHATEVER REASON, MAKE ALL REMAINING PORTION IN THAT RUN THE SAME SIZE. THE MAXIMUM ALLOWABLE LENGTH OF FLEXIBLE METALLIC CONDUIT SHALL NOT EXCEED 18 INCHES.
5. EXCEPT AS OTHERWISE INDICATED, PROVIDE THE TYPE OF CONDUIT LEGALLY PERMITTED OR REQUIRED FOR EACH LOCATION OR CONDITION.
6. USE GALVANIZED RIGID CONDUIT WITH METALLIC INSULATED BUSHINGS.
7. SUPPORT CONDUIT AT LEGAL INTERVALS, AS SPECIFIED BY THE NATIONAL ELECTRICAL CODE. PROVIDE ADDITIONAL SUPPORTS WHERE OBVIOUSLY REQUIRED OR AS DIRECTED. PERFORATED STRAP OR PLUMBERS TAPE ARE NOT ACCEPTABLE FOR CONDUIT SUPPORTS. DO NOT INSTALL ONE INCH OR LARGER RACEWAYS IN OR THROUGH STRUCTURAL MEMBERS UNLESS APPROVED BY ENGINEER. REPLACE ANY DENTED OR DAMAGED CONDUIT. SUPPORTS AT STRUCTURAL STEEL MEMBERS USE BEAM CLAMPS, DRILLING OR WELDING MAY BE USED ONLY AS NECESSARY.
8. ROUTE CONDUIT TO AVOID DRAINS OR OTHER GRAVITY LINES, WHERE CONFLICTS OCCUR, RELOCATE CONDUIT AS REQUIRED. KEEP CONDUIT AT LEAST 6" FROM THE COVERINGS ON HOT WATER AND STEAM PIPES AND AT LEAST 18" FROM THE COVERINGS OF FLUES AND BREACHING, AND AT LEAST 12" FROM FUEL LINES AND GAS LINES. RUN CONDUIT EXPOSED TO VIEW PARALLEL WITH OR AT RIGHT ANGLES TO STRUCTURAL MEMBERS, WALLS, OR LINES OF THE BUILDING. ROUTE ALL EXPOSED CONDUIT TO PRESERVE HEADROOM ACCESS SPACE AND WORK SPACE. TURN CONDUITS WITH NEAT SYMMETRICAL BENDS. WHEN INSTALLING CONDUIT THROUGH EXISTING SLABS OR WALLS MAKE PROVISIONS FOR LOCATING POSSIBLE CONFLICTING ITEMS WHERE CONDUIT IS TO PENETRATE, USE TONE SIGNAL OR X-RAY METHODS TO INSURE THAT NO PENETRATIONS WILL BE MADE INTO EXISTING CONDUIT, PIPING, CABLES, POST-TENSION CABLES, ETC.
9. THE CONTRACTOR SHALL VERIFY EXACT LOCATION OF TERMINAL BOXES AND CONDUIT ENTRANCES OF ALL EQUIPMENT AGAINST SHOP DRAWINGS BEFORE STUBBING UP CONDUITS.
10. CONDUIT FITTINGS AND SUPPORT ARE NOT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL FURNISH ALL SUPPORT CHANNELS, CLAMPS, HARDWARE, ETC. MATERIAL TO BE SUITABLE FOR THE AREA WHERE THEY ARE TO BE INSTALLED. ENGINEER WILL GUIDE CONTRACTOR IN SUPPORTING EQUIPMENT NOT DETAILED IN THE PLANS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL SLEEVES AND OPENINGS REQUIRED FOR THE PASSAGE OF ELECTRICAL RACEWAYS OR CABLES EVEN WHEN THESE OPENINGS OR SLEEVES ARE NOT SPECIFICALLY SHOWN ON THE DRAWINGS.
12. THE MINIMUM SIZE OF CONDUITS INSTALLED BELOW GRADE SHALL BE 1" UNLESS OTHERWISE STATED.
13. THE MINIMUM SIZE OF CONDUIT INSTALLED ABOVE GRADE SHALL BE 3/4" UNLESS OTHERWISE NOTED.
14. LABEL EACH CONDUIT AT BOTH ENDS WITH CONDUIT NUMBERS. COORDINATE CONDUIT NUMBERING REQUIREMENT WITH THE ENGINEER AND OWNER DURING CONSTRUCTION
15. ALL CONDUIT PENETRATING EXTERIOR WALLS MUST HAVE A WATER TIGHT CONDUIT PENETRATION SEAL INSTALLED.
16. ALL PCS CONDUIT SHALL BE ROBROY RED H2OT OR OCAL BLUE AND SHALL BE INSTALLED USING TOOLING AS RECOMMENDED BY THE CONDUIT MANUFACTURER. PCS CONDUIT SHALL BE USED FOR ALL EXPOSED CONDUIT, STUB-UP AND RISERS TO GRADE FLOOR OR EQUIPMENT FROM NONMETALLIC CONDUITS, ENTERING AND EXISTING UNDERGROUND CONDUIT RUNS A MINIMUM 12-INCHES ABOVE AND BELOW GRADE AND FOR ALL UNDERGROUND BENDS WHERE THE TOTAL DEFLECTION IS GREATER THAN 45 DEGREES. USE PVC-COATED FITTINGS FOR PCS CONDUITS.
17. ALL PVC40 CONDUIT SHALL BE EXTRUDED FROM VIRGIN PVC COMPOUND, RATED FOR 90 DEGREES CELSIUS CABLES AND RATED FOR USE IN DIRECT SUNLIGHT.

WIRES, CABLES, CONNECTORS

1. PROVIDE NEW CONDUCTORS MANUFACTURED WITHIN 1 YEAR OF THE DATE OF DELIVERY TO THE SITE. STORE CONDUCTORS OUT OF THE WEATHER AND WHERE NOT SUBJECT TO DAMAGE OR OTHER DELETERIOUS CONDITIONS. UNLESS SPECIFICALLY INDICATED OTHERWISE, CONDUCTOR SIZES ARE FOR SOFT DRAWN COPPER, MINIMUM 98% CONDUCTIVITY.
2. EXCEPT AS INDICATED, PROVIDE MINIMUM SIZE NO. 12 AWG CONDUCTORS WITH MINIMUM INSULATION RATING OF 600 VOLTS. CONDUCTORS NO. 1 AWG AND SMALLER SHALL BE STRANDED AND USE DUAL RATED THWN/THHN INSULATION, UNLESS OTHERWISE INDICATED. CONDUCTORS NO. 1/0 AWG AND LARGER OR THOSE INSTALLED UNDERGROUND SHALL BE STRANDED WITH TYPE XHHW INSULATION, UNLESS OTHERWISE.
3. WHERE A COMMON NEUTRAL IS RUN FOR TWO OR THREE HOME RUN CIRCUITS, PHASE CONDUCTORS SHALL BE CONNECTED TO BREAKERS IN THE PANEL WHICH ARE ATTACHED TO SEPARATE PHASE LEGS IN ORDER THAT THE NEUTRAL CONDUCTORS WILL CARRY ONLY THE UNBALANCED CURRENT. NEUTRAL CONDUCTORS SHALL BE OF THE SAME SIZE AS THE PHASE CONDUCTORS UNLESS SPECIFICALLY NOTED OTHERWISE.
4. INSTALL WIRES IN ONLY APPROVED RACEWAYS. PULL IN WIRE WITH AN APPROVED WIRE PULLING LUBRICANT, EQUAL TO IDEAL "YELLOW", EFCOR WGY, POLYWATER, OR EQUAL AS RECOMMENDED BY CABLE MANUFACTURER FOR ALL WIRE NO. 4 AND LARGER, OR WHERE NECESSARY, DO NOT USE OIL, GREASE OR SIMILAR SUBSTANCES. DO NOT INSTALL WIRE IN: INCOMPLETE CONDUIT RUNS; UNTIL AFTER THE CONCRETE WORK AND PLASTERING IS COMPLETED; UNTIL AFTER ALL MOISTURE IS SWABBED FROM CONDUITS. BEFORE INSTALLING CONDUCTOR, REMOVE DEBRIS AND MOISTURE FORM CONDUIT AND EQUIPMENT ENCLOSURES.
5. NEATLY ARRANGE AND LACE CONDUCTORS IN CONTROL PANELS, SWITCHBOARDS, PANELBOARDS, GUTTERS AND TERMINAL CABINETS USING WIRE TIES AS MANUFACTURERED BY TY-RAP, PANDUIT, ETC.
6. ONLY COMPRESSION TYPE CONNECTORS ARE ALLOWED FOR WIRE SPLICES (NO TWIST ON CONNECTORS ARE ALLOWED I.E., WIRENUTS, SCOTCH- LOCKS, ETC.). USE BUCHANAN COMPRESSION SPLICE CAPS (TYPICALLY NUMBER 2006S, ETC.) FOR WIRE NO. 10 AWG AND SMALLER. USE BURNDY "VERSITAPS" AND HEAVY-DUTY CONNECTORS; O.Z. SOLDERLESS CONNECTORS; EQUIVALENT BY BUCHANAN, KEARNEY, OR PENN UNION, FOR WIRE NO. 8 AWG AND LARGER. MAKE ALL CONNECTIONS WITH THE PROPER TOOL AND DIE AS SPECIFIED BY THE DEVICE MANUFACTURER. USE ONLY TOOLING AND DIES MANUFACTURED BY THE DEVICE MANUFACTURER. INSULATE ALL CONNECTIONS AND SPLICES WITH PREMOLDED PLASTIC COVERS, OR HEAT SHRINK TUBING AND CAPS.
7. EVERY WIRE SHALL BE MARKED AT BOTH ENDS OF THE CONDUCTOR, AT ALL TERMINAL BLOCKS AND FINAL DESTINATION EQUIPMENT. USE MACHINE PRINTED HEAT SHRINK SLEEVE TYPE MARKERS. HAND MARKING IS NOT ACCEPTABLE. VERIFY WITH THE ENGINEER WHAT WIRE IDENTIFICATION SYSTEM SHALL BE USED IF NOT DESCRIBED WITHIN THESE DRAWINGS.

GROUNDING

1. THE CONDUIT SYSTEM IS NOT ALLOWED FOR EQUIPMENT GROUNDING. INSTALL A SEPARATE GREEN EQUIPMENT GROUND WIRE IN EACH CONDUIT AND BOND TO EQUIPMENT AT BOTH ENDS. SIZE AS PER N.E.C., UNLESS OTHERWISE NOTED.
2. ALL METALLIC STRUCTURES, METALLIC ENCLOSURES, AND ELECTRICAL EQUIPMENT SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED AND GROUND CONNECTIONS SHALL BE MADE TO THE PLANT GROUND GRID. THE GROUND CONDUCTOR SHALL BE SIZED PER N,E,C. UNLESS OTHERWISE NOTED.

EQUIPMENT

1. ALL CIRCUIT BREAKERS SHALL BE MANUFACTURED PER UL 489.
2. PANELBOARDS SHALL MANUFACTURED BY EATION, GE, OR SCHNEIDER ELECTRIC, NO EQUALS. PANELBOARDS SHALL BE PROVIDED WITH TIN PLATED COPPER BUS. PROVIDE WITH DEAD FRONT CONSTRUCTION WITH LOCKABLE HINGED DOOR.

CONSTRUCTION

1. REMOVE OR RELOCATE ALL ELECTRICAL WIRING, EQUIPMENT, FIXTURES, ETC., WHICH MAY BE ENCOUNTERED IN REMOVED OR REMODELED AREAS IN THE EXISTING AREAS EFFECTED BY THIS WORK. WIRING WHICH SERVES USABLE EXISTING OUTLETS SHALL BE RESTORED AND ROUTED CLEAR OF THE CONSTRUCTION OR DEMOLITION. REMOVE ALL UNUSED WIRE AND CONDUIT AND LEAVE SITE CLEAN. REMOVED MATERIALS NOT SCHEDULED FOR REUSE SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND REMOVED FROM THE SITE.
2. DO ALL PATCHING TO THE SAME QUALITY AND APPEARANCE AS THE ORIGINAL WORK AND WHERE REQUIRED OR DIRECTED, EMPLOY THE PROPER TRADESMEN TO SECURE THE DESIRED RESULTS. SEAL AROUND ALL CONDUITS, WIRES, AND CABLES PENETRATING WALLS, CEILINGS, AND FLOOR IN ALL LOCATIONS WITH A FIRE STOP MATERIAL.
3. MAINTAIN ALL SURFACES TO BE PAINTED IN A CLEAN AND SMOOTH CONDITION, WHERE ELECTRICAL WORK IS EXPOSED TO VIEW, REMOVE ALL FOREIGN MATERIAL AND RESTORE ALL DAMAGED FINISHES. AT THE COMPLETION OF THE WORK, LEAVE LIGHTING FIXTURES AND LAMPS CLEAN.
4. ALL DEBRIS, RUBBISH, AND SCRAPS, ETC., ASSOCIATED WITH THE ELECTRICAL WORK SHALL BE REMOVED EACH NIGHT AND ALL AREAS ARE TO BE LEFT SWEPT CLEAN EACH NIGHT.

SUBMITTALS

1. PROVIDE A SEPARATE SUBMITTAL FOR ALL COMMODITIES AND EQUIPMENT REQUIRED FOR THE PROJECT. PROVIDE SUFFICIENT PRODUCT DATA TO CONFIRM ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS ARE MET.
2. PROVIDE ALL FIELD TESTING RESULTS.
3. PROVIDE OPERATION AND MAINTENANCE MANUALS FOR ALL ELECTRICAL EQUIPMENT.

FIELD TESTING

1. PERFORM INSULATION-RESISTANCE TESTS ON EACH CONDUCTOR WITH RESPECT TO GROUND AND ADJACENT CONDUCTORS: APPLIED VOLTAGE SHALL BE 500 VDC FOR 300-VOLT RATED CABLE AND 1000 VDC FOR 600-VOLT RATED CABLE.
2. IN ADDITION TO THE TESTING NOTED HEREIN, FOR ALL ELECTRICAL EQUIPMENT, PERFORM ALL TESTING FOR EACH PIECE OF EQUIPMENT AS RECOMMENDED BY NETA (INTERNATIONAL ELECTRICAL TEST ASSOCIATION).

PROGRAMMING

1. THE EXISTING MULBERRY EFFLUENT PUMP STATION PLC SHALL BE PROGRAMMED TO CONTROL THE NEW ACTUATOR, MOV-1, SHOWN ON DRAWING E-04, THE PLC SHALL BE PROGRAMMED TO OPEN MOV-1 WHEN EITHER THE EAST POND FILL VALVE OR WEST POND FILL VALVE ARE OPENED. MOV-1 SHALL CLOSE WHEN BOTH THE EAST AND WEST FILL POND VALVES ARE CLOSED. THE EXISTING MULBERRY EFFLUENT PUMP STATION PLC SHALL RECEIVE THE EAST/WEST POND FILL VALVE POSITION STATUS VIA THE EXISTING DATA COMMUNICATION LINK BETWEEN THE MULBERRY EFFLUENT PUMP STATION PLC AND THE EXISTING EAST AND WEST POND CONTROL PANELS. MOV-1 SHALL ALSO OPEN WHEN THE HYDROPNEUMATIC TANK VCP REQUESTS THE TANK TO BE FILLED, THE VALVE SHALL BE OPENED PRIOR TO THE EXISTING MULBERRY EFFLUENT PUMPS STARTING.
2. THE EXISTING ISLAND RE-USE PLC PANEL SHALL COMMUNICATE VIA ETHERNET WITH THE ISLAND RE-USE PUMP VCP TO HAVE A SOFTWARE INTERLOCK SO THE EXISTING ISLAND RE-USE PUMPS DO NOT OPERATE WHEN THE NEW RE-USE PACKAGED PUMP STATION PUMPS ARE OPERATING AND VICE VERSA. THE EXISTING CONTROL SYSTEM (WUNDERWARE GALAXY) SHALL BE UPDATED TO INCLUDE A NEW SCREEN FOR THE PACKAGED PUMP STATION, THE SCREEN SHALL INCLUDE ALL STATUS (RUNNING, FAILED, FLOW, PRESSURE, ETC.) AND THE ABILITY TO START AND STOP THE PUMPS FROM THE PLANT CONTROL SYSTEM.
3. THE NEW ACTUATORS IN LINE A AND LINE B AT THE SMOKETREE/95 INTERSECTION SHALL BE PROGRAMMED TO BE OPENED FROM THE EXISTING MULBERRY WUNDERWARE GALAXY CONTROL SYSTEM. THE EXISTING CONTROL PANEL AT SMOKETREE AND 95 COMMUNICATES TO THE EXISTING MULBERRY PLANT CONTROL SYSTEM VIA A LICENSED RADIO. THE NEW MICROLOGIX PLC LOCATED IN THE EXISTING CONTROL PANEL AT SMOKETREE/95 SHALL BE REPROGRAMMED TO MATCH THE EXISTING PROGRAM AND I/O CURRENTLY INSTALLED ON THE EXISTING MICROLOGIX PLC. THE EXISTING I/O IS THE FOLLOWING: DISCRETE INPUTS - HIGH PRESSURE, HIGH TEMPERATURE, POWER FAILURE, AIR CONDITIONER FAILURE VALVE POWER, VALVE FAILURE, DISCRETE OUTPUTS - VALVE OPEN, VALVE CLOSE, ANALOG INPUT - PRESSURE.

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: KJA
Drawn by: VYJ
Checked by: MJP
Date: AUGUST 2016
Dwg scale:

ELECTRICAL
ELECTRICAL AND PROGRAMMING SPECIFICATIONS

Registered Professional Engineer
CERTIFICATE NO.
53655
KEVIN JEFFREY ANGLE
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2018

carollo

BID SET

Sheet Number:
E-003
Sheet 37 OF 43

Plot Date: 31-AUG-2016 3:25:06 PM
User: jmireles
PlotScale: 2:1
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ColorTable: gshade.ctb
Model: Layout1
LAST SAVED BY: JMireles

PROJECT NO. 9800A10 FILE NAME: P2-9800A10_E-003.dgn

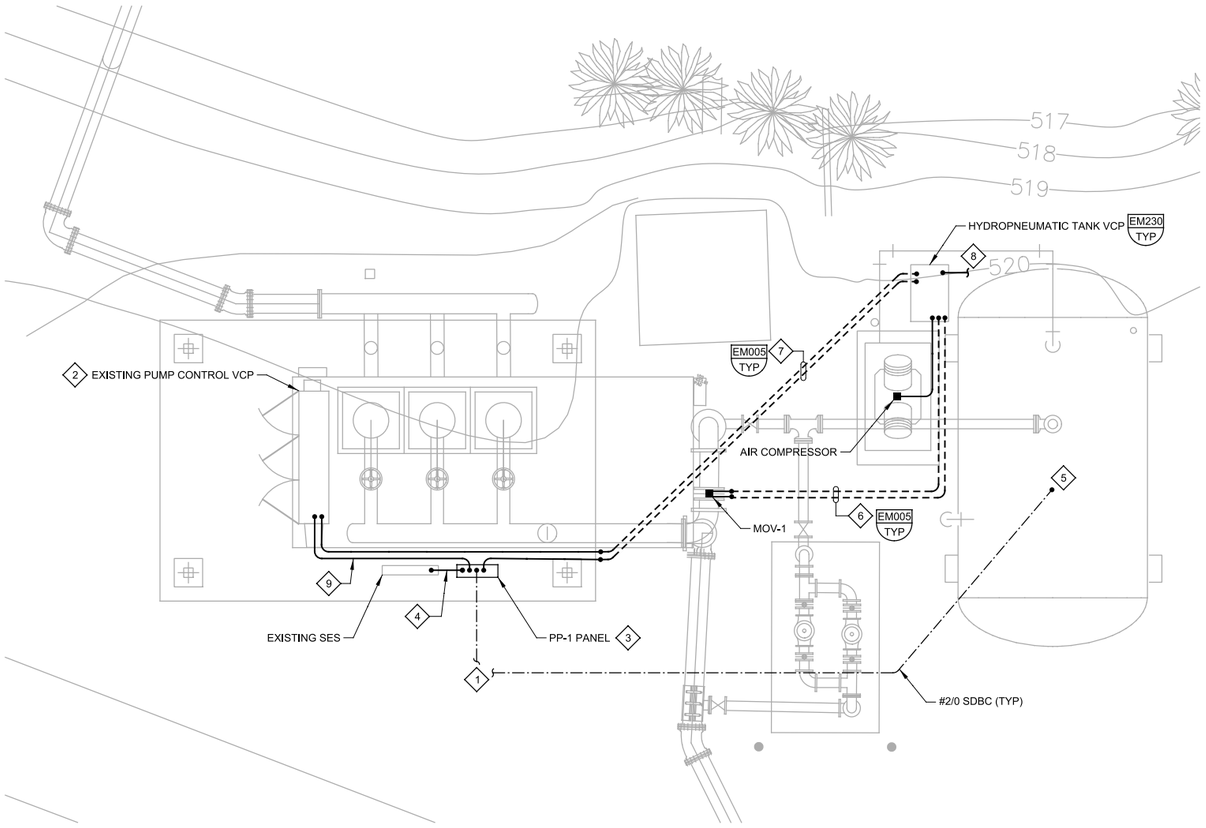
GENERAL NOTES:

1. PROVIDE 6-INCHES OF SLT CONDUIT FOR ALL CONDUITS TRANSITIONING FROM UNDERGROUND TO ABOVE GROUND CONDUITS. SLT CONDUIT PROVIDE TO ALLOW FOR DIFFERENTIAL SETTLEMENT.
2. DEMOLISH EXISTING CABLE AND CONDUIT BETWEEN THE EXISTING SES AND THE EXISTING PUMP CONTROL VCP. SEAL ALL OPENINGS TO MAINTAIN THE NEMA OF THE ENCLOSURE.

KEY NOTES:

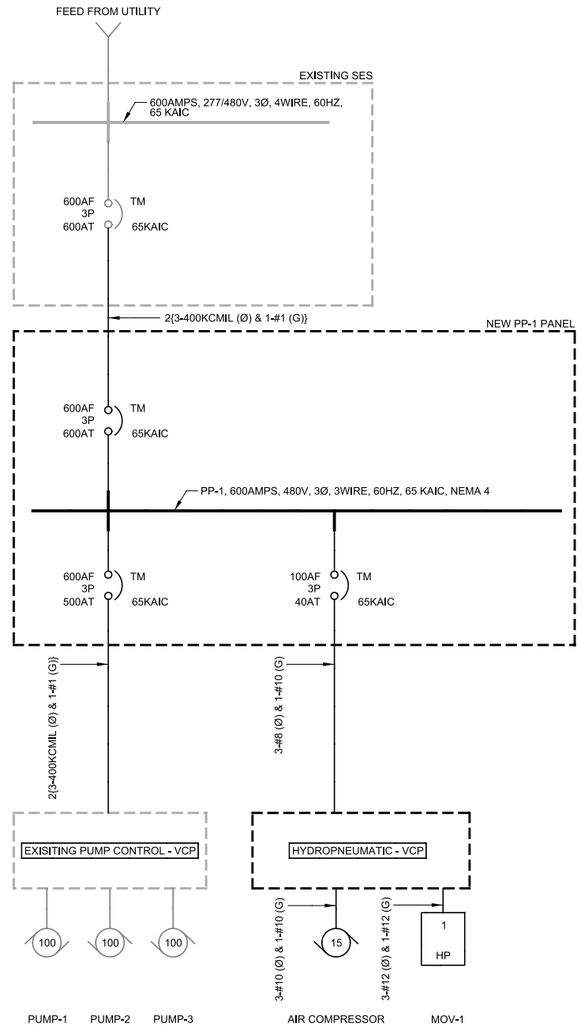
1. TIE TO THE EXISTING GROUND RING. CONNECT TO THE EXISTING GROUND PER DETAIL EG101/TYP. FIELD INVESTIGATE THE LOCATION FOR EXISTING GROUND GRID.
2. PROVIDE NEW TERMINAL BLOCKS FOR ALL NEW I/O SIGNALS, DISCRETE INPUTS: WEST POND VALVE OPENED, WEST POND VALVE CLOSED, WEST POND VALVE IN-REMOTE, EAST POND VALVE OPENED, EAST POND VALVE CLOSED, EAST POND VALVE IN-REMOTE, EFFLUENT PS RUN COMMAND, HYDROPNEUMATIC TANK LOW LEVEL, HYDROPNEUMATIC TANK HIGH LEVEL, HYDROPNEUMATIC TANK LOW PRESSURE, HYDROPNEUMATIC TANK HIGH PRESSURE, HYDROPNEUMATIC TANK FEED VALVE OPENED, HYDROPNEUMATIC TANK FEED VALVE CLOSED, DISCRETE OUTPUTS: WEST POND VALVE OPEN COMMAND, WEST POND VALVE CLOSE COMMAND, EAST POND VALVE OPEN COMMAND, EAST POND VALVE CLOSE COMMAND, EFFLUENT PS RUNNING STATUS.
3. MOUNT PP-1 ON MOUNTING STAND PER TYPICAL DETAIL EM230.
4. PROVIDE TWO 3-INCH CONDUITS WITH 3-#400 (Ø) AND 1-#1 (G) EACH.
5. CONNECT TO GROUND LUG ON TANK. COORDINATE WITH THE MANUFACTURER FOR EXACT LOCATION OF GROUND LUG.
6. PROVIDE TWO 1-INCH CONDUITS. ONE CONDUIT SHALL CONTAIN 10-#14 AND 1-#14(G) FOR CONTROLS BETWEEN MOV-1 AND THE HYDROPNEUMATIC TANK VCP. CONTROLS SHALL INCLUDE THE FOLLOWING DISCRETE SIGNALS: DISCRETE INPUTS - EFFLUENT PS RUN COMMAND, HYDROPNEUMATIC TANK LOW LEVEL, HYDROPNEUMATIC TANK HIGH LEVEL, HYDROPNEUMATIC TANK LOW PRESSURE, HYDROPNEUMATIC TANK HIGH PRESSURE, HYDROPNEUMATIC TANK FEED VALVE OPENED, HYDROPNEUMATIC TANK FEED VALVE CLOSED AND DISCRETE OUTPUTS - VALVE OPEN COMMAND, VALVE CLOSED COMMAND. THE OTHER CONDUIT SHALL CONTAIN 3-#12(Ø) AND 1-#12(G) FOR POWER TO MOV-1 FROM THE HYDROPNEUMATIC TANK VCP.
7. PROVIDE A 1.5-INCH CONDUIT WITH 30-#14 AND 1-#14(G) FOR CONTROLS BETWEEN THE HYDROPNEUMATIC TANK VCP AND THE EXISTING EFFLUENT PS PLC, PROVIDE A 1-INCH CONDUIT WITH 3-#8(Ø) AND 1-#10(G) FOR POWER TO THE HYDROPNEUMATIC TANK VCP FROM PP-1. WHERE CONDUITS ARE INSTALLED ABOVE GRADE, CONDUITS SHALL BE SUPPORTED FROM PIPE SUPPORTS, WHERE ADDITIONAL SUPPORT IS REQUIRED PER THE NEC, PROVIDE SUPPORT PER DETAIL EM104/TYP.
8. FIELD ROUTE ALL CABLE AND CONDUIT REQUIRED BY THE MANUFACTURER BETWEEN the HYDROPNEUMATIC TANK AND THE HYDROPNEUMATIC TANK VCP, AT A MINIMUM, THE FOLLOWING SHALL BE ROUTED, COORDINATE WITH THE MANUFACTURER FOR ADDITIONAL CABLE/CONDUIT WHICH MAY BE REQURIED:

   PRESSURE SWITCH - 2-#14 AND 1-#14(G) IN A 3/4-INCH CONDUIT
   PRESSURE TRANSMITTER - 1-2/CS#16 AND 1-#14(G) IN A 3/4-INCH CONDUIT
   ADD AIR SOLENOID VALVE - 2#14 AND 1-#14(G) IN A 3/4-INCH CONDUIT
   VENT AIR SOLENOID VALVE - 2#14 AND 1-#14(G) IN A 3/4-INCH CONDUIT
9. PROVIDE TWO 3-INCH CONDUITS WITH 3-#400 (Ø) AND 1-#1 (G) EACH.



PUMP STATION PLAN

SCALE: 1/4"=1'-0"
FILE: P2-9800A1010E101



LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: KJA
Drawn by: VYJ
Checked by: MJP
Date: AUGUST 2016
Dwg scale:

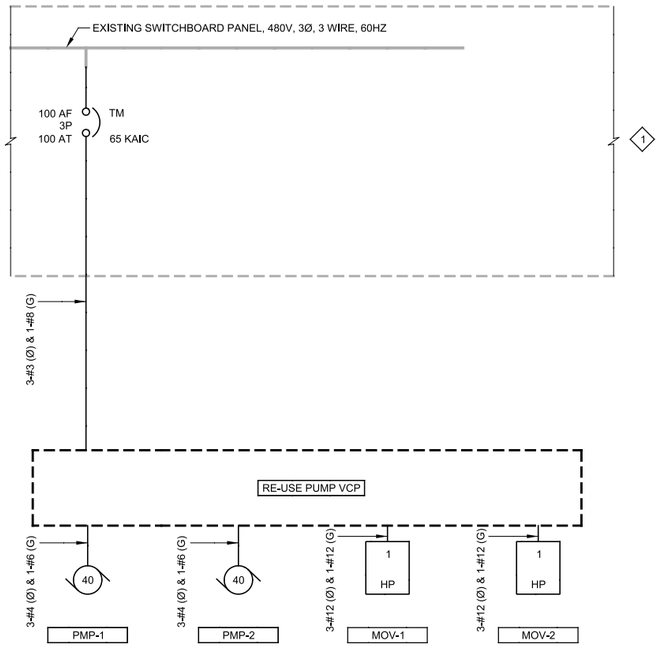
ELECTRICAL
MULBERRY WWTP
ONE-LINE AND
POWER PLAN

Registered Professional Engineer — CERTIFICATE NO. — 53655 — KEVIN JEFFREY ANGLE — DATE SIGNED — ARIZONA, U.S.A.
EXPIRES 06-30-2018

carollo

BID SET

Sheet Number:
E-004
Sheet 38 OF 43



A ONE-LINE DIAGRAM

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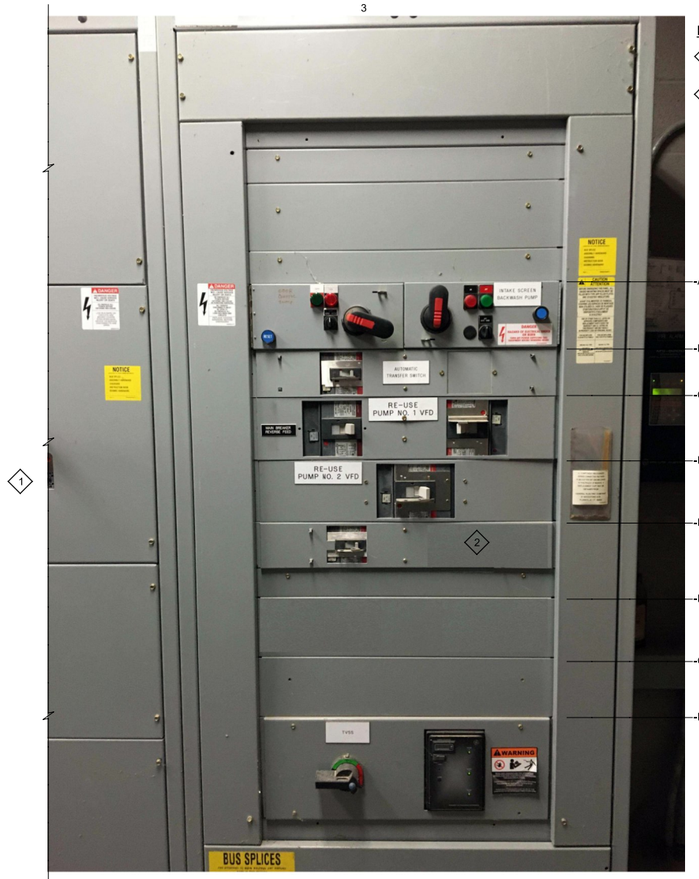

B ELEVATION

FILE: P2-9800A1003E651

3AL- ODOR CONTROL SUMP

3AR- INTAKE SCREEN BACKWASH PUMP

3B- AUTOMATIC TRANSFER SWITCH

3CL- MAIN BREAKER REVERSE FEED

3CR- RE-USE PUMP NO. 1 VFD

3D- RE-USE PUMP NO. 2 VFD

3EL- "UNLABELED"

3ER- RE-USE PUMP VCP

GENERAL NOTES:

1. EXISTING SWITCHBOARD IS A GE SPECTRA SERIES. FIELD VERIFY THE SHORT CIRCUIT RATING OF THE SWITCHBOARD. THE SHORT CIRCUIT RATING OF THE BREAKER SHALL MATCH THE RATING OF THE SWITCHBOARD.

KEY NOTES:

1. NOT ALL LOADS ARE SHOWN.
2. PROVIDE NEW 100AT BREAKER FOR THE RE-USE PUMPS VCP. COORDINATE ALL SWITCHBOARD MODIFICATIONS WITH THE SWITCHBOARD MANUFACTURER.

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BID SET

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NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT

WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: VK
Drawn by: EYP
Checked by: MJP
Date: AUGUST 2016
Dwg scale:

ELECTRICAL
ISLAND RE-USE PS SWBD
ELEVATION AND ONE-LINE DIAGRAM

Registered Professional Engineer
CERTIFICATE NO.
53655
KEVIN JEFFREY ANGLE
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2018

Sheet Number:
E-005
Sheet 39 OF 43

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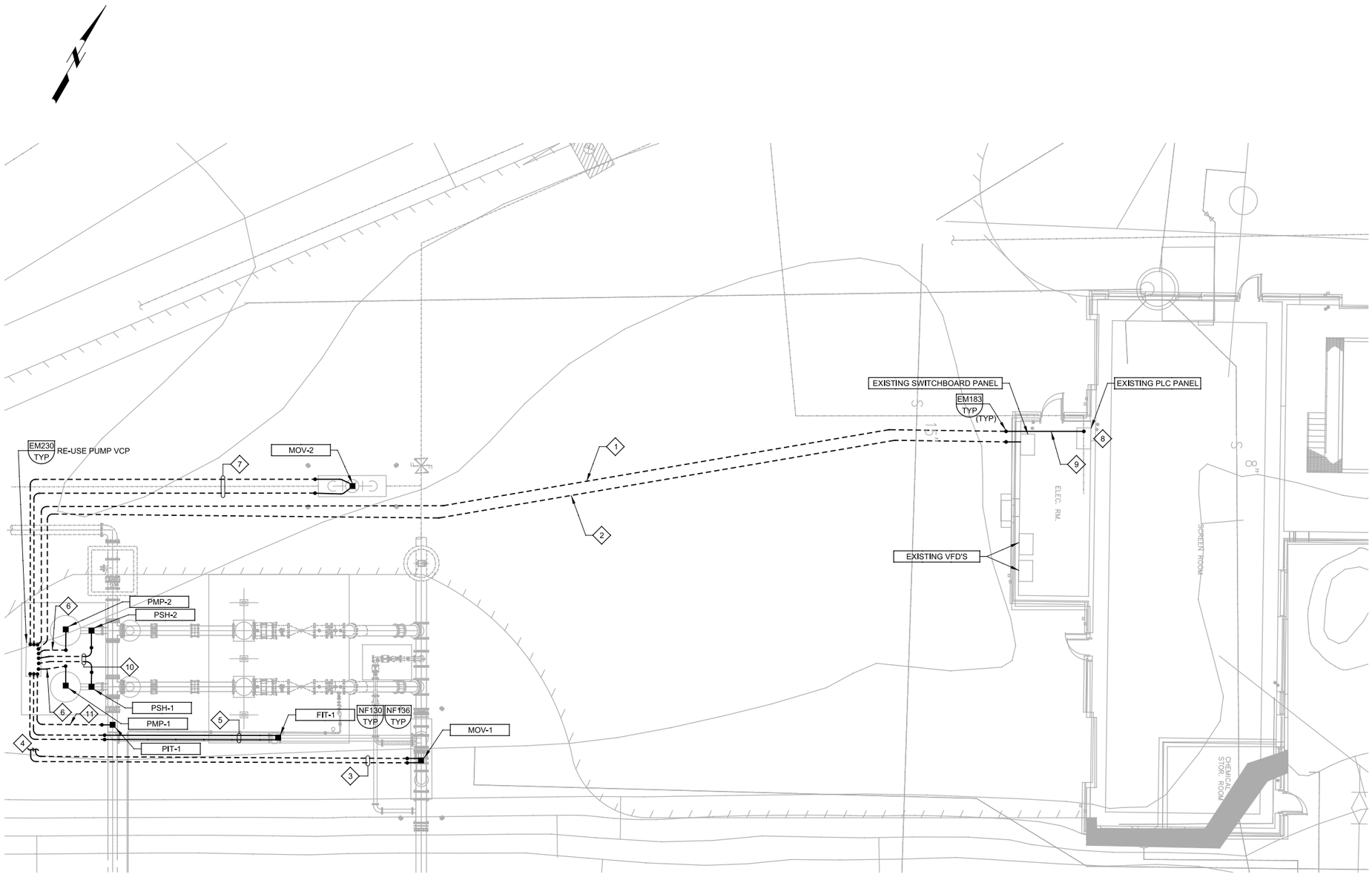

A **PLAN**
SCALE: 1/8"=1'-0"
FILE: P2-9800A1010E102

GENERAL NOTES:

1. ALL UNDERGROUND CONDUITS SHALL BE INSTALLED PER DETAIL EM005/TYP UNLESS OTHERWISE NOTED.

KEY NOTES:

1. PROVIDE A 1-INCH CONDUIT WITH 1-CAT 6 & 1-#14(G) FOR COMMUNICATION BETWEEN THE RE USE PUMPS VCP AND THE EXISTING PLC PANEL.
2. PROVIDE A 1.5-INCH CONDUIT WITH 3-#3(Ø) & 1-#8(G) FOR POWER BETWEEN THE RE-USE PUMPS VCP AND THE EXISTING SWITCHBOARD.
3. PROVIDE TWO 1-INCH CONDUITS. ONE CONDUIT SHALL CONTAIN 10-#14 & 1-#14(G) FOR CONTROLS BETWEEN MOV-1 AND THE RE-USE PUMPS VCP. CONTROLS SHALL INCLUDE THE FOLLOWING DISCRETE SIGNALS: DISCRETE INPUTS - VALVE OPENED, VALVE CLOSED, VALVE IN REMOTE AND DISCRETE OUTPUTS - VALVE OPEN COMMAND, VALVE CLOSED COMMAND, THE OTHER CONDUIT SHALL CONTAIN 3-#12(Ø) & 1-#12(G) FOR POWER TO MOV-1 FROM THE RE-USE PUMPS VCP.
4. CONDUIT CONTINUE TO RE-USE PUMPS VCP. NOT SHOWN FOR DRAWING CLARITY.
5. PROVIDE TWO 1-INCH CONDUITS. ONE CONDUIT SHALL CONTAIN 2-#12 & 1-#12(G) FOR POWER TO FIT-1 FROM THE RE-USE PUMPS VCP. THE OTHER CONDUIT SHALL CONTAIN 1-2/CS#16 FOR ANALOG SIGNAL FROM FIT-1 TO THE RE-USE PUMPS VCP. WHERE CONDUITS ARE INSTALLED ABOVE GRADE, CONDUITS SHALL BE SUPPORTED FROM PIPE SUPPORTS. WHERE ADDITIONAL SUPPORT IS REQUIRED PER THE NEC, PROVIDE SUPPORT PER DETAIL EM104/TYP.
6. FOR EACH PUMP, PROVIDE A 1.5-INCH CONDUIT WITH 3-#4(Ø) & 1-#6(G) FOR POWER BETWEEN THE PUMP AND THE RE-USE PUMPS VCP.
7. PROVIDE TWO 1-INCH CONDUITS. ONE CONDUIT SHALL CONTAIN 10-#14 & 1-#14(G) FOR CONTROLS BETWEEN MOV-2 AND THE RE-USE PUMPS VCP. CONTROLS SHALL INCLUDE THE FOLLOWING DISCRETE SIGNALS: DISCRETE INPUTS - VALVE OPENED, VALVE CLOSED, VALVE IN REMOTE AND DISCRETE OUTPUTS - VALVE OPEN COMMAND, VALVE CLOSED COMMAND, THE OTHER CONDUIT SHALL CONTAIN 3-#12(Ø) & 1-#12(G) FOR POWER TO MOV-2 FROM THE RE-USE PUMPS VCP.
8. USE EXISTING ETHERNET PORT FOR COMMUNICATION TO THE RE-USE PUMPS VCP. PLC SHALL BE PROGRAMMED TO COMMUNICATE ALL SIGNALS TO THE EXISTING CONTROL SYSTEM. PROVIDE NEW SCADA SCREENS FOR THE NEW RE-USE PUMPS PACKAGED PUMP STATION FOR STATUS AND CONTROL REMOTELY FROM SCADA. THE RE-USE PUMPS PACKAGED PUMP STATION SHALL BE INTERLOCKED VIA SOFTWARE WITH THE EXISTING RE-USE PUMPS. THE PACKAGED PUMP STATION SHALL NOT OPERATE IF EITHER OF THE EXISTING RE-USE PUMPS ARE IN USE AND THE EXISTING RE-USE PUMPS SHALL NOT OPERATE IF THE NEW RE-USE PUMPS PACKAGED PUMP STATION IS IN USE.
9. USE EXISTING CONDUIT SUPPORTS OR SUPPORT PER DETAIL EM102/TYP.
10. FOR EACH PRESSURE SWITCH, PROVIDE A 3/4-INCH CONDUIT WITH 2-#14 & 1-#14(G).
11. PROVIDE A 3/4-INCH CONDUIT WITH 1-2/CS#16 & 1#14(G)

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT

WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: VK	Drawn by: EYP	Checked by: MJP	Date: AUGUST 2016	Dwg scale:

ELECTRICAL

ISLAND RE-USE PUMP
STATION POWER PLAN

Registered Professional Engineer
CERTIFICATE OF
53655
KEVIN JEFFREY
ANGLE
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 06-30-2018

carollo

BID SET

Sheet Number:
E-006
Sheet 40 OF 43

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PROJECT NO. 9800A10 FILE NAME: P2-9800A10_E-006.dgn

PLAN
SCALE: 3/32"=1'-0"
FILE: P2-9800A1010E103

A DETAIL
SCALE: NTS
FILE:

B DETAIL
SCALE: NTS
FILE:

KEY NOTES:

1. 18-INCH ACTUATOR - LINE B.
2. 18-INCH ACTUATOR - LINE A.
3. LOCATION OF EXISTING SES AND CONTROLLER. REFER TO DETAIL A AND B FOR PICTURE.
4. PROVIDE 1-INCH CONDUIT WITH 2-#12 & 1-#12(G) FOR POWER AND 1-INCH CONDUIT WITH 10-#14 AND 1-#14(G) FOR DISCRETE SIGNALS (DISCRETE INPUTS - VALVE OPENED POSITION, VALVE CLOSED POSITION, VALVE IN-REMOTE, AND DISCRETE OUTPUTS - VALVE OPEN COMMAND, VALVE CLOSED COMMAND). INSTALL PER DETAIL EM005/TYP. COORDINATE WITH ALL ADOT AND THE CITY TRAFFIC DEPARTMENT FOR ALL CORDINATION PRIOR TO INSTALLATION OF CONDUIT. AS NECESSARY, BORE UNDER EXISTING ROAD FOR CONDUIT PLACEMENT, RESTORE ALL AREAS TO THEIR ORIGINAL CONDITION.
5. PROVIDE 2 NEW 20A-1P BREAKERS FOR POWER TO THE NEW VALVE ACTUATORS. ROUTE NEW 120 VAC WIRING IN EXISTING WIRE DUCT. FIELD INVESTIGATE EXISTING POWER DISTRIBUTION CABLING AND MODIFY AS NECESSARY TO ACCOMMODATE THE NEW BREAKERS. PROVIDE THE OWNER WITH RED-LINED DRAWINGS SHOWING THE MODIFICATIONS TO THE PANEL WIRING DIAGRAMS.
6. PROVIDE NEW MICROLOGIX L32BWAA CONTROLLER. PRIOR TO PROCUREMENT, VERIFY EXISTING I/O IS 24 VDC. PROVIDE VERIFICATION OF 24 VDC I/O WITH THE SUBMITTAL FOR THE MICROLOGIX CONTROLLER. INSTALL EXISTING PROGRAM ON THE NEW CONTROLLER AND MAKE ALL MODIFICATIONS REQUIRED TO PROGRAM THE NEW VALVES.
7. PROVIDE NEW 35MM DIN-RAIL AND FINGER SAFE TERMINAL BLOCKS FOR ALL NEW DISCRETE I/O WIRING.
8. REPLACE EXISTING 40A-2P BREAKER WITH NEW 80A-2P BREAKER. BREAKER SHORT CIRCUIT RATING SHALL MATCH THE RATING OF THE PANEL.
9. DEMOLISH EXISTING 2-#8(Ø) & 1-#10(G). PROVIDE NEW 2-#3(Ø) & 1-#8(G) IN EXISTING CONDUIT FOR POWER.

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: VK
Drawn by: JCM
Checked by: MJP
Date: AUGUST 2016
Dwg scale:

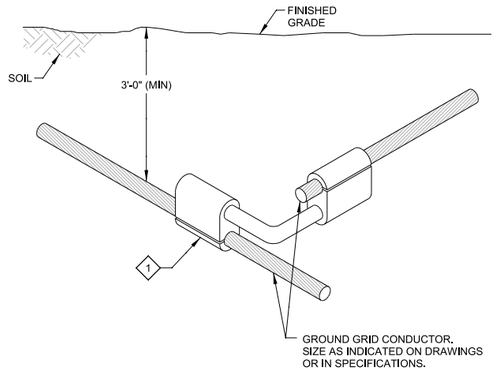
ELECTRICAL
SMOKETREE
POWER PLAN

Registered Professional Engineer
CERTIFICATE NO.
53655
KEVIN JEFFREY
ANGLE
DATE SIGNED 08/31/2016
ARIZONA, U.S.A.
EXPIRES 06-30-2018

carollo

BID SET

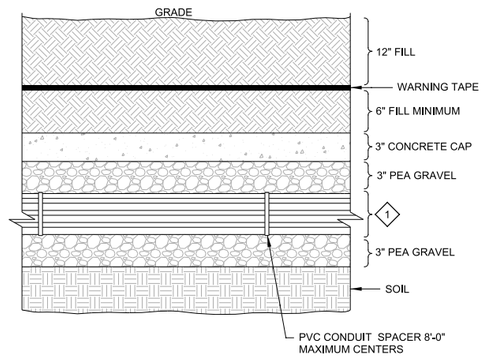
Sheet Number:
E-007
Sheet 41 OF 43



KEY NOTES:

1. GROUND GRID CROSS CONNECTOR. SIZE FOR CABLE PER CONECTOR MANUFACTURERS GUIDELINES.

EG101 TYP S — COPPER GROUNDING CABLE CONNECTION
COMPRESSION CONNECTION

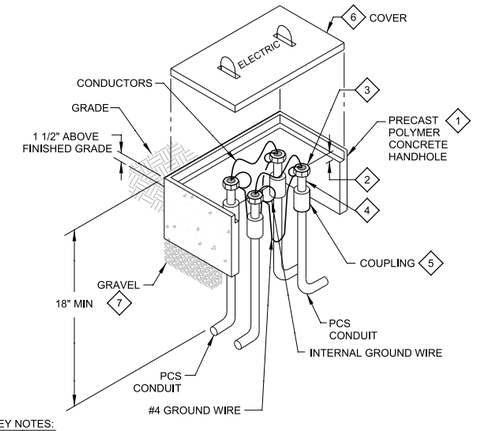


KEY NOTES:

1. REFER TO DRAWINGS FOR CONDUIT SIZE. ALL CONDUITS SHALL BE PVC40.

EM005 TYP J — PEA GRAVEL BEDDED DUCT BANK

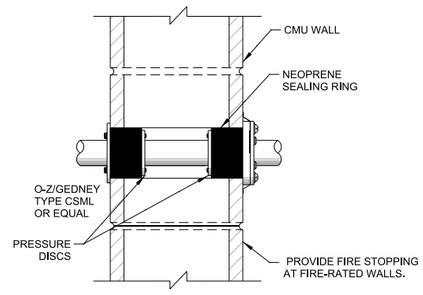
8/29/16



KEY NOTES:

1. PRECAST POLYMER CONCRETE HANDHOLE WITH OPEN BOTTOM FOR DRAINAGE. DO NOT INSTALL POLYMER CONCRETE HANDHOLES IN ROADWAYS.
2. ALLOW SUFFICIENT SPACE BETWEEN THE CONDUIT AND HANDHOLE LID FOR BENDING RADIUS OF WIRES AND CABLES.
3. INSULATED GROUNDING BUSHINGS. BOND BUSHINGS TO EACH OTHER WITH #4 WIRE AND TO GROUND CONDUCTORS IN EACH CONDUIT.
4. NIPPLE (USED TO COMPACT DUCT SEAL IN COUPLING).
5. PACK COUPLING AREA WITH DUCT SEAL BY MANVILLE OR APPROVED EQUAL.
6. PROVIDE "TIER"-RATED COVER PER MANHOLE AND HANDHOLE SCHEDULE.
7. GRAVEL BED FOR LEVELING & DRAINAGE. MINIMUM 12" DEEP & EXTENDING AT LEAST 6" EACH WAY PAST OUTSIDE LIMITS OF HANDHOLE.

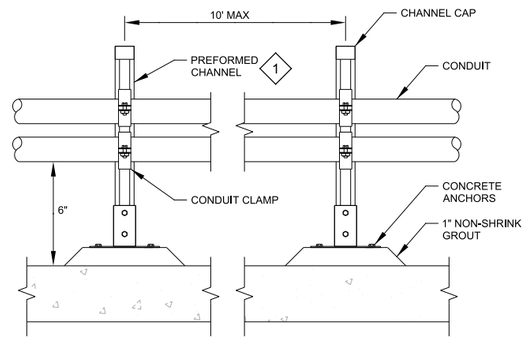
EM052 TYP S — ELECTRICAL HANDHOLE:
PRECAST POLYMER CONCRETE



KEY NOTES:

1.

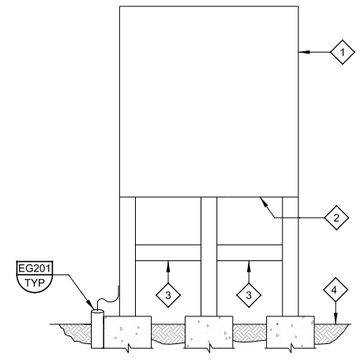
EM183 TYP S — CORE HOLE PENETRATION
PARTIALLY GROUTED CMU WALL



KEY NOTES:

1. SIZE PREFORMED CHANNEL FOR CONDUITS INDICATED ON THE DRAWINGS.

EM104 TYP S — CONDUIT FLOOR SUPPORT
FOR ELECTRICAL CONDUITS



KEY NOTES:

1. FABRICATE SUPPORT STRUCTURE OF SUFFICIENT SIZE TO SAFELY AND ADEQUATELY ACCOMODATE ALL INDICATED ELECTRICAL EQUIPMENT. UTILIZE 4" x 4" GALVANIZED SQUARE TUBING WELDED FRAME. WELD END CAPS ON SQUARE TUBING AS NEEDED. BEVEL EDGES AND REMOVE ALL SHARP EDGES. PRIME AND PAINT WITH A MINIMUM OF 2 COATS EPOXY PAINT.
2. WELD 1/4" STEEL PLATE TO SQUARE TUBING SUPPORT STRUCTURE, FRONT AND BACK. BEVEL EDGES AND REMOVE ALL SHARP EDGES. PAINT AS PER NOTE 1.
3. CROSS MEMBER FOR CONDUIT BRACING.
4. VERIFY LOCAL SOIL CONDITIONS WHEN FABRICATING CONCRETE PIER. SIZE PIER TO ADEQUATELY AND SAFELY SUPPORT EQUIPMENT STRUCTURE.

EM230 TYP S — ELECTRICAL EQUIPMENT
SUPPORT STRUCTURE

carollo

BID SET

LAKE HAVASU CITY

NO.	REVISIONS / SUBMISSIONS	DATE

LAKE HAVASU CITY
COMMUNITY INVESTMENT DEPARTMENT
WATER CONSERVATION
PROGRAM IMPLEMENTATION
PACKAGE NO. 2

Designed by: VK
Drawn by: EYP
Checked by: MJP
Date: AUGUST 2016
Dwg scale:

ELECTRICAL
TYPICAL DETAILS - I

Registered Professional Engineer — CERTIFICATE NO. 53655 — KEVIN JEFFREY ANGLE — DATE SIGNED 08/31/2016 — ARIZONA, U.S.A.
EXPIRES 06-30-2018

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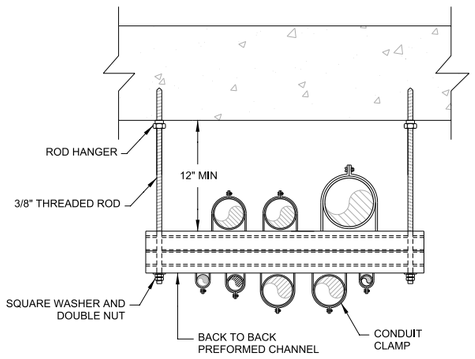
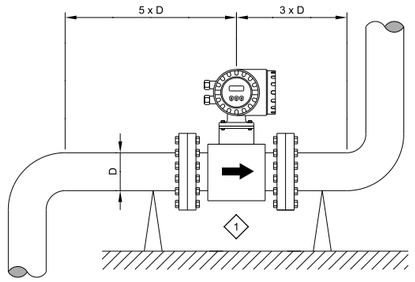
E-008
Sheet 42 OF 43



NOTES:

1. FILL UPPER LAYER BEFORE HANGING RACEWAY FROM UNDERSIDE.
2. MATERIAL FOR PREFORMED CHANNEL, FITTINGS, AND CLAMPS SHALL BE PER THE SPECIFICATIONS.

EM102 TYP S — CONDUIT TRAPEZE EXISTING STRUCTURES



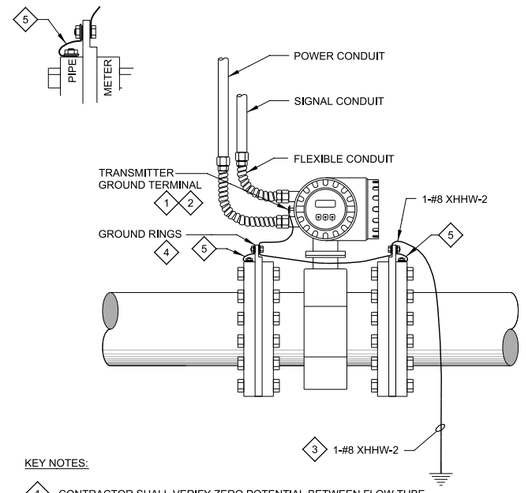
NOTES:

1. FOLLOW MANUFACTURER'S RECOMMENDED MAXIMUM TORQUE SETTINGS. DO NOT OVER-TORQUE FLANGE BOLTS. OVERTIGHTENING THE FASTENERS WILL DEFORM SEALING FACES OR DAMAGE THE LINE.
2. ALWAYS TIGHTEN FLANGE BOLTS UNIFORMLY AND IN DIAGONALLY OPPOSITE SEQUENCE.
3. MOUNT METER SO THAT IT REMAINS FULLY FLOODED.
4. INSTALL METER SUCH THAT THERE ARE NO PIPE BENDS FOR 5 PIPE DIAMETERS UPSTREAM AND 3 PIPE DIAMETERS DOWNSTREAM OF THE METER.

KEY NOTES:

1. PIPE SUPPORTS BY MECHANICAL CONTRACTOR. NO SUPPORTS SHALL BE INSTALLED AT THE METER HOUSING.

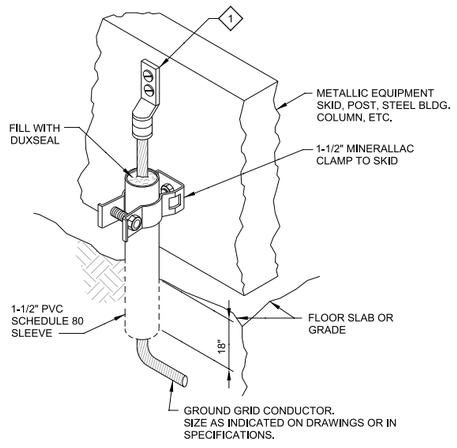
NF130 TYP S — MAGNETIC FLOW MOUNTING DETAIL



KEY NOTES:

1. CONTRACTOR SHALL VERIFY ZERO POTENTIAL BETWEEN FLOW TUBE, EARTH GROUND AND TRANSMITTER GROUND TERMINAL.
2. CONNECT TRANSMITTER GROUND TERMINAL TO GROUND RINGS.
3. CONNECT METER BODY TO EARTH GROUND POTENTIAL.
4. EQUALIZE POTENTIAL VIA GROUND RINGS BETWEEN FLUID AND MAGMETER.
5. PROVIDE BONDING JUMPER ON CONDUCTIVE PIPES.

NF136 TYP S — INTEGRAL MAGNETIC FLOWMETER GROUNDING DETAIL



NOTES:

1. CLEAN ALL PAINTED SURFACES TO BARE METAL BEFORE BOLTING ON THE GROUND LUG.
2. NOTE: BOLT GROUND LUG ONLY TO EQUIPMENT SKIDS OR STRUCTURE, NOT TO EQUIPMENT OR TANK SHELLS.

KEY NOTES:

1. HEAVY DUTY COMPRESSION TERMINAL.

EG201 TYP S — EQUIPMENT SKID GROUNDING COMPRESSION CONNECTION

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TYPICAL DETAILS - II

Registered Professional Engineer — CERTIFICATE NO. — 53655 KEVIN JEFFREY ANGLE — DATE SIGNED — ARIZONA, U.S.A.

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Sheet Number:

E-009

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Plot Date: 31-AUG-2016 3:26:36 PM
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